Vol. 941 Number 5

OFFICIAL GAZETTE

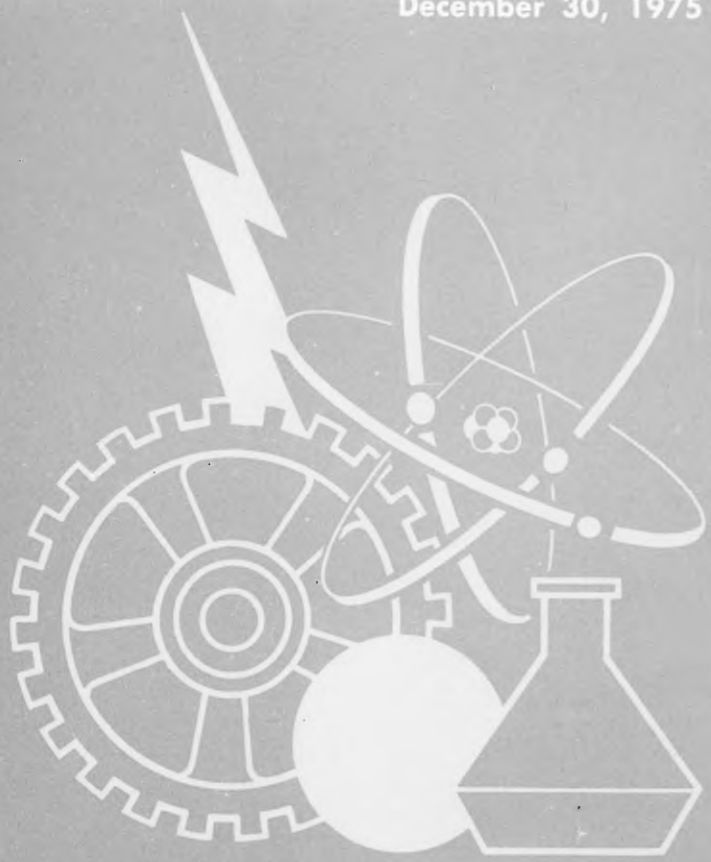
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

AMOCO OIL CO.
JAN 2 1976
RESEARCH LIBRARY

PATENTS

December 30, 1975



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 30, 1975 Volume 941 Number 5

CONTENTS

	Page
Patent and Trademark Notices	
Patent Suits	1988
An "Open Letter" to Subscribers and Readers of the Official Gazette of the United States Patent and Trademark Office	1988
National Inventors Day	1990
Examination	1990
Patent Notices	
Certificates of Correction for the Week of December 30, 1975	1991
Errata	1991
Condition of Patent Applications	1992
Reissue Patents Granted (28,666)	1993
Patents Granted	
General and Mechanical (3,928,871)	1995
Chemical (3,929,401)	2171
Electrical (3,930,111)	2351
Design Patents Granted (238,216)	2407
Index of Patentees	PI 1
Cross Reference of Published Patent Applications Published Under Trial Voluntary Protest Program	PI 47
Indices of Applicants of Reissues and Designs	PI 51
Classification of	
Patents (Including Reissues)	PI 53
Designs	PI 55
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 56
Designs	PI 58

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $342.20 per annum, foreign mailing $85.55 additional; single copies $6.60 each.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly, subscription $88.40 per annum, foreign mailing $22.10 additional; single copies $1.70 each.

CIRCULARS OF GENERAL INFORMATION concerning PATENTS, price 60 cents each.

CIRCULARS OF GENERAL INFORMATION concerning TRADEMARKS, price 50 cents each.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,918,976, D. F. Cole, ELECTRIC BROILER; **3,091,171,** same, BROILER, **filed** Aug. 19, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74-2235-36, *David F. Cole* v. *Sears, Roebuck & Company.* The judgment of the District Court is reversed as to the last issue, and in all other respects said judgment is affirmed, Aug. 19, 1975.

3,063,024, L. Davis, Jr., MICROWAVE STRIP TRANSMISSION LINE CIRCULATORS, **filed** Sept. 3, 1975, D.C., M.D. Fla. (Tampa), Doc. 75-635-C-T-K, *Raytheon Company* v. *Trak Microwave Corp.*

3,091,171. (See 2,913,976.)

3,181,939, Marshall and Roschuk, FUSED ALUMINA-ZIRCONIA ABRASIVES, **filed** Aug. 22, 1975, United States Court of Appeals, First Circuit, Massachusetts (Boston), Doc. 75-1310, *Norton Company* v. *Carborundum Company.*

3,192,624, D. Gringer, KNIFE HANDLE WITH ADJUSTABLE BLADE, **filed** Aug. 22, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2830, *Allway Tools, Inc.* v. *Industrias Egana, S.A. and Great Neck Saw Manufacturers, Inc.*

3,255,780, B. L. Squirrell, FLEXIBLE HOSE OF INTERLOCKING HELICAL CONVOLUTIONS, **filed** Aug. 29, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-2940-DWW, *Plastiflex Co.* v. *Consolidated Foods, Inc.*

3,265,048, L. J. Herbon, COOLING SYSTEM; **3,499,481,** W. C. Avrea, PRESURIZED LIQUID COOLING SYSTEM; **3,601,181,** same, METHOD AND APPARATUS FOR PURGING AIR FROM INTERNAL COMBUSTION ENGINE COOLING SYSTEM, **filed** May 13, 1975, D.C., E.D. Mich. (Detroit), Doc. 75-70881, *General Motors Corp.* v. *Saf-Gard Systems, Inc.*

3,268,636, R. G. Angell, Jr., METHOD AND APPARATUS FOR INJECTION MOLDING FOAMED PLASTIC ARTICLES, **filed** Nov. 22, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72-426, *Union Carbide Corporation* v. *Borg-Warner Corporation.* That judgment be entered in favor of defendants, that claim 1 of patent has not been infringed; that claim 1 of patent is invalid for obviousness and lack of novelty; and that said patent is invalid and void in its entirety for failure to disclose the best mode to carry out the invention, Aug. 22, 1975.

3,292,341, J. D. Frost, ORIENTING AND PACKING APPARATUS, **filed** Aug. 4, 1975, D.C., E.D. Calif. (Fresno), Doc. F-75-141, *James D. Frost* v. *Sunkist Growers, Inc.*

3,391,484, P. W. Darin, AILERON CONTROL FOR MODEL AIRPLANES, **filed** Sept. 3, 1975, D.C., E.D. Mich. (Detroit), Doc. 75-71679, *Pio W. Darin* v. *John Josiatis, doing business as Joe's Hobby Center.*

3,437,149, Cugini and Jeannerett, CABLE FEED-THROUGH MEANS AND METHOD FOR WELL HEAD CNSTRUCTIONS, **filed** Sept. 8, 1975, D.C., S.D. Tex. (Houston), Doc. 75-H-1530, *Seaboard Pipe & Equipment Company, Inc.* v. *FMC Corporation.*

3,499,481. (See 3,265,048.)

3,506,385, Weber and Cressman, PHOTOFLASH LAMP; **3,598,984,** S. L. Slomski, PHOTOFLASH LAMP ARRAY; **3,598,985,** Harnden and Kornrumpf, CONSTRUCTION OF DISPOSABLE PHOTOFLASH LAMP ARRAY; **3,609,332,** D. R. Schindler, PHOTOFLASH LAMP ARRAY WITH REFLECTOR-LAMP MODULE; **3,725,693,** Anderson, Hanson, Lecrone and Landgraf, LINEAR PHOTOFLASH LAMP ARRAY AND REFLECTOR UNIT THEREFOR, **filed** Apr. 4, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1083, *General Electric Company* v. *GTE Sylvania Inc.* Enter order joint motion for entering of an order for dismissal granted, May 15, 1975.

3,525,147, V. E. Kieffer, METHOD OF MAKING A FIELD MEMBER FOR A DYNAMOELECTRIC DEVICE, **filed** Dec. 26, 1974, D.C., N.D. Ind. (Fort Wayne), Doc. F-74-146, *Wagner Electric Corporation and Industra Products, Inc.* v. *Essex International, Inc.* **Same, filed** Aug. 21, 1975, D.C., S.D. Ohio (Dayton), Doc. C-3-75-208, *Industra Products, Inc.* v. *Machine Products Corp.*

3,541,606, Heenan and Nagel, REFLECTORIZED VEHICLES AND REFLECTORS THEREFOR, **filed** Aug. 2, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2192, *Amerace Corporation* v. *Sate-Lite Mfg. Co. et al.* Dismissed by stipulation with prejudice, July 7, 1975.

3,591,282, W. Renold, FILM POSITIONING SYSTEM; **Re. 28,046,** same, **filed** Sept. 3, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75-2980-WPG, *Seaco Computer-Display Incorporated* v. *Terminal Data Corporation and Michael Rothbart.*

3,598,984. (See 3,506,385.)

3,599,038, D. D. Skidmore, APPARATUS AND SYSTEMS FOR HIGH-VOLTAGE ELECTROSTATIC CHARGING OF PARTICLES; **3,731,145,** R. S. Senay, ELECTROSTATIC SPRAY GUN WITH SELF-CONTAINED MINIATURIZED POWER PACK INTEGRAL THEREWITH, **filed** July 2, 1975, D.C., N.D. Ohio (Toledo), Doc. C75-270, *Nordson Corporation* v. *Owens-Illinois, Inc. and Gema AG Apparatebau.*

3,601,181. (See 3,265,048.)

3,609,332. (See 3,506,385.)

3,706,156, E. L. Thornell, MUSICAL WRISTWATCH TOY; **D. 224,661,** same, HOUSING FOR A TOY MUSIC BOX, **filed** Aug. 7, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2233, *Marlin Toy Products, Inc.* v. *Sears, Roebuck and Co. et al.* Enter order of stipulation and order of dismissal with prejudice, granted, June 24, 1975.

3,725,693. (See 3,506,385.)

3,731,145. (See 3,599,038.)

3,732,419, Kulberg and Muehllehner, SCINTILLATION CAMERA WITH IMPROVED RESOLUTION, **filed** Mar. 19, 1975, D.C., N.D. Ohio (Cleveland), Doc. C75-250, *Searle Analytic, Inc.* v. *Ohio Nuclear, Inc.* Order dismissing plaintiff's complaint without prejudice and defendant's counterclaim is dismissed with prejudice, Aug. 27, 1975.

3,803,332, Seiferth, Austin, and Paul, BACON PACKAGE, **filed** Aug. 26, 1975, D.C., C.D. Calif. (Los Angeles), Doc. 75-2882-DWW, *John E. Stoneman* v. *American Can Co.*

3,811,453, C. Bretton, METHOD AND MEANS FOR ATTACHING A HAIR SUPPLEMENT, **filed** Sept. 8, 1975, D.C. Minn. (Minneapolis), Doc. 4-75-C-458, *Allen Arthur Co., Inc.* v. *David Green, doing business as Greer's Hair Replacement Studio.*

3,831,553, R. R. Theitu, WICK FOR OIL DISPENSING APPARATUS; **D. 232,144,** J. A. Ford, SHELF SPINDLE, **filed** Sept. 11, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3030, *Kirsch Company* v. *Edgecraft Corporation et al.*

Re. 28,046. (See 3,591,282.)

D. 198,760, L. T. Harris, RIVETLESS CHAIN LINK, **filed** Feb. 10, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-66, *Janes Manufacturing, Inc.* v. *Portec, Inc.*

D. 224,661. (See 3,706,156.)

D. 232,144. (See 3,831,553.)

An "Open Letter" to Subscribers and Readers of the Official Gazette of the United States Patent and Trademark Office

Dear Subscriber or Reader:

Presented in this Notice Section of the OFFICIAL GAZETTE is a tabulation of the results of the Cost-Survey cards sent in by subscribers and users of the O.G. The cards appeared at 935 O.G. 1 (June 3, 1975). The approximately 25% of subscribers who took time to inform us of their views and concerns have my sincere thanks.

Pursuant to the responses indicated therein the Patent and Trademark Office will retain the present practice of printing claims rather than abstracts in the O.G., and will not make available a "notices" leaflet. Effective immediately a fourth-class mail option is being made available by the U.S. Government Printing Office for all subscribers. This may be elected upon initial subscription or at the time of renewal. The cost is $250.00 per annum (first-class mail is $342.20). We are initiating a test on a microfiche edition of the O.G. Patents Section with a target for final evaluation and possible implementation by the spring of 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Category, percent of returns	No. surveys/ (No. readers)	Microfiche					Favor abstracts																			
		Subscribe		Copies	Retain O.G.		Mechanical		Electrical		Chemical		Entire		Fourth class mail		O.G. leaflet									
																	Subscribe				Replace O.G.					
Subscriber 14.5%		Yes	No		Would	Would not	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No			Yes	No				
Partner, emp. law firm 16.0%	211 (731)	69 (184)	132 (535)	54	8	60	71 (367)	70 (181)	63 (328)	61 (138)	60 (354)	60 (195)	101 (413)	75 (217)	159 (559)	45 (110)	55 (149)	144 (575)			34 (43)	132 (417)				
Employee Co. 63.8%	227 (1,316)	72 (466)	146 (656)	67	13	60	58 (365)	112 (686)	56 (360)	109 (671)	53 (327)	113 (697)	80 (406)	124 (691)	171 (968)	49 (300)	68 (380)	138 (802)			9 (49)	174 (1,069)				
Librarian 2.2%	902 (4,762)	295 (1,608)	566 (2,917)	216	67	215	249 (1,288)	312 (1,845)	220 (1,202)	280 (1,693)	186 (1,104)	337 (2,015)	392 (1,899)	373 (2,195)	656 (3,206)	205 (1,414)	132 (802)	718 (3,765)			23 (83)	743 (3,999)				
User public library 0.1%	31 (516)	14 (154)	15 (350)	5	2	10	8 (115)	9 (75)	5 (13)	7 (75)	7 (47)	9 (60)	12 (275)	14 (131)	12 (106)	13 (385)	2 (21)	23 (488)			1 (1)	23 (152)				
Unknown 0.4%	1 (1)	0	1 (1)	0	0	0	0	1 (1)	0	1 (1)	0	1 (1)	0	0	1 (1)	0	0	0			0	0				
Government 2.7%	5 (5)	2 (2)	2 (2)	2	0	1	0	3 (3)	0	3 (3)	0	3 (3)	1 (1)	3 (3)	4 (4)	1 (1)	1 (1)	2 (3)			0	3 (3)				
Subtotal 100%	38 (144)	17 (55)	19 (84)	15	1	15	8 (26)	18 (79)	9 (28)	16 (77)	5 (13)	21 (92)	11 (27)	19 (93)	30 (108)	6 (33)	11 (46)	24 (100)			5 (13)	31 (117)				
Responses (No. green cards)	1,415 (7,475)	460 (2,499)	881 (4,748)	359	91	361	394 (2,161)	525 (2,870)	363 (1,931)	486 (2,638)	311 (1,845)	544 (3,093)	606 (3,111)	608 (3,330)	1,033 (4,952)	319 (2,233)	269 (1,418)	1,049 (5,772)			61 (178)	1,126 (5,787)				
Total	17 (53)	7 (23)	10 (30)	4	0	6	3 (10)	7 (27)	3 (10)	7 (27)	3 (10)	7 (27)	9 (25)	7 (27)	9 (28)	7 (23)	8 (26)	8 (26)			1 (4)	12 (34)				
	1,432 (7,528)	476 (2,522)	891 (4,778)	363	91	367	397 (2,171)	532 (2,897)	366 (1,941)	493 (2,685)	314 (1,855)	551 (3,120)	615 (3,136)	615 (3,357)	1,042 (4,980)	326 (2,266)	277 (1,444)	1,057 (5,708)			62 (182)	1,138 (5,821)				

NOTES:
1. Surveys which were marked "subscriber" and another category were listed in the other category.
2. The percentage figure under each category is the ratio of the number of surveys in that category to the sub-total number of surveys returned.
3. The number of readers was considered "one" if no number was specified, or if "100's" or "1,000's" was written. A range, e.g. "5 to 9," was recorded as its average value (7 in the example).
4. Twelve of the total yeses under "O.G. Leaflet-subscribe" and six of the yeses under "O.G. Leaflet-replace" were conditioned on having microfiche available.

National Inventor's Day

The 4th Annual National Inventor's Day Exhibit will be held on Saturday and Sunday, February 7 and 8, 1976 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
Chairman.

Dec. 1, 1975.

Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent & Trademark Office as patent attorneys or agents will be held on Tuesday, March 2, 1976.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent & Trademark Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent & Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Applications to take the examination must be filed in the Patent & Trademark Office together with a $35 fee not later than January 31, 1976.

Application blanks may be obtained from the Clerk of the Patent & Trademark Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents & Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 30, 1975

Re. 28,547	3,872,035	3,896,737	3,906,538
D. 227,409	3,873,740	3,896,804	3,907,014
D. 236,099	3,874,354	3,897,045	3,907,259
3,641,088	3,874,451	3,897,064	3,907,409
3,676,482	3,874,549	3,897,396	3,907,734
3,732,377	3,877,312	3,898,272	3,907,935
3,740,307	3,877,392	3,898,742	3,908,066
3,761,496	3,879,765	3,898,940	3,908,265
3,771,195	3,880,147	3,899,520	3,908,585
3,779,159	3,880,931	3,899,570	3,908,644
3,785,569	3,881,057	3,899,604	3,908,796
3,786,116	3,883,949	3,899,628	3,908,835
3,786,902	3,884,053	3,899,718	3,908,921
3,791,219	3,884,097	3,899,923	3,908,971
3,793,402	3,884,676	3,900,033	3,909,059
3,800,641	3,885,024	3,900,069	3,909,178
3,807,653	3,885,735	3,900,356	3,909,274
3,809,461	3,887,433	3,900,391	3,909,304
3,819,308	3,888,016	3,900,458	3,909,367
3,825,568	3,889,027	3,900,798	3,909,458
3,833,645	3,889,729	3,901,083	3,909,476
3,838,032	3,890,003	3,901,196	3,909,494
3,838,067	3,890,139	3,902,050	3,909,744
3,842,083	3,890,161	3,902,086	3,910,717
3,842,452	3,890,783	3,902,535	3,910,989
3,844,838	3,891,454	3,902,600	3,911,005
3,846,674	3,891,702	3,902,910	3,911,096
3,847,713	3,891,925	3,903,333	3,911,456
3,849,430	3,892,490	3,903,471	3,911,651
3,860,630	3,892,686	3,904,293	3,911,701
3,860,879	3,892,695	3,904,383	3,911,718
3,862,310	3,893,597	3,904,478	3,911,892
3,865,322	3,893,703	3,904,594	3,911,955
3,867,291	3,894,113	3,904,995	3,912,002
3,868,335	3,894,410	3,905,157	3,912,591
3,869,338	3,894,890	3,905,190	3,912,606
3,870,695	3,895,242	3,905,541	3,912,882
3,870,705	3,895,299	3,905,757	3,912,928
3,871,132	3,895,968	3,905,980	3,913,026
3,871,764	3,896,206	3,906,439	

Errata

All reference to Patent No. 3,921,357 to Earl L. Unruh of California for "Mobile Home Skirting Side Panel" appearing in the OFFICIAL GAZETTE of November 25, 1975 should be deleted since no patent was granted.

All reference to Patent No. 3,923,080 to Alan Allread of Michigan for "Frangible Valved Fitting" appearing in the OFFICIAL GAZETTE of December 2, 1975 should be deleted since no patent was granted.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF DECEMBER 6, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-2-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-18-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-23-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-17-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-18-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-3-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-26-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-21-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-4-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-12-75

Expiration of patents: The patents within the range of numbers indicated below expire during December 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,862,205 to 2,866,972 inclusive
Plant Patents..... Numbers 1,775 to 1,791 inclusive

REISSUES

DECEMBER 30, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,666

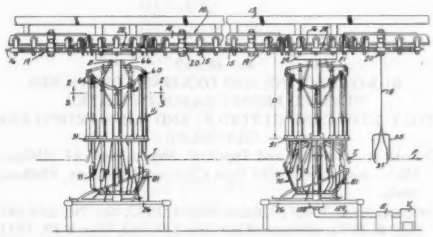
POULTRY PROCESSING METHOD AND APPARATUS

Grover S. Harben, Jr., Gainesville, Ga., assignor to Gainesville Machine Company, Inc., Gainesville, Ga.

Original No. 3,806,988, dated Apr. 30, 1974, Ser. No. 228,962, Feb. 24, 1972. Application for reissue July 12, 1974, Ser. No. 488,053

Int. Cl.[2] A22B *3/08*

U.S. Cl. 17—11 **21 Claims**



1. In a poultry processing system having a conveyor with a plurality of shackle means for suspending poultry therefrom in a head lowermost position and drive means for moving the shackle means and poultry successively along a predetermined path, apparatus for supporting and orienting the poultry with respect to a processing tool comprising:

a support frame;

a vertically extending main shaft rotatably journalled in said support frame,

a 180° idler unit connected to the conveyor including an idler sprocket attached to the upper end of said main shaft for rotating said shaft, said idler sprocket engaged by the conveyor drive means and rotated thereby to rotate said sprocket and main shaft at the same rate as the shackle means and the poultry are moving;

a circular tool support table attached to said main shaft intermediate its ends and rotatable therewith, said tool support table lying in a horizontal plane below said idler unit with a radius sufficient for the outside peripheral edge of said table to engage and position the shackle means as they pass around said idler unit, said tool support table including a plurality of holding means equally spaced about the periphery of said table adjacent its peripheral edge, one of said holding means radially aligned with each of the shackles as it passes around said idler unit;

a tool support carried by each of said holding means;

a tool mandrel reciprocably carried by each of said tool supports and mounting said processing tool on the lower end thereof, said mandrel including first cam follower means at the upper end thereof and guide means, said guide means maintaining a predetermined rotational relationship between said mandrel and said tool support table;

a first annular cam member carried by said support frame adjacent the upper ends of said mandrels and engagable by said first cam follower means to reciprocably position each of said mandrels and the processing tool carried thereby;

a plurality of first deflection subassemblies pivotally carried by said tool support table therebelow, one of said deflection subassemblies being associated with and radially aligned with each of said mandrels and its associated tool, each of said deflection subassemblies including an inverted U-shaped support member comprising a longer depending leg facing said mandrel and a shorter depending leg facing said main shaft, a V-shaped deflection plate mounted on the depending end of said longer leg for engaging poultry carried by the shackle means adjacent the processing tool associated with said support member, a second cam follower roller rotatably carried by the depending end of said shorter leg, a second radial cam rotatably mounted around said main shaft for engagement by said roller to selectively position said deflection plate and the poultry for the insertion of the processing tool into its body cavity, and carriage means connecting said second radial cam to said support frame to hold same stationary;

a plurality of second orienting subassemblies carried by said main shaft below said support table, one of said orienting subassemblies being associated with each of said mandrels and its processing tool and vertically aligned therewith, a carriage plate carried by said main shaft for rotation therewith and pivotally mounting each of said orienting subassemblies, each of said orienting subassemblies including a U-shaped rod member pivoted to said carriage plate, said rod member comprising a pair of legs having an upturned hook portion at the extending ends thereof, a third annular cam carried by said support frame and engaging said rod member to selectively pivot said hook portions into engagement with the poultry between its body and legs on either side of the processing to prevent upward movement of the poultry during removal of the processing tool from its body cavity.

Re. 28,667

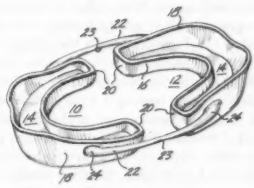
DOUBLE TRAY DENTAL APPARATUS

Kenneth W. Gores, Bellevue, Wash., assignor to Kirkman Laboratories, Inc., Portland, Oreg.

Original No. 3,536,069, dated Oct. 27, 1970, Ser. No. 856,395, Sept. 9, 1969. Application for reissue Feb. 3, 1972, Ser. No. 223,343

Int. Cl.[2] A61F *5/56*

U.S. Cl. 128—136 **6 Claims**



1. Dental apparatus, comprising:

a pair of upper and lower dentition [encasing troughs;] *trays;*

a hairpin-shaped resilient bridge member disposed adjacent the buccal exteriors of said paired [troughs] *trays* at each side;

said resilient members each having a U-end between a pair of outwardly biased legs; [and]

said trays and said resilient members being formed of the same pliant material; and

said legs being joined to said [trough] *tray* sides forward of the posterior portions thereof, *the ends of each said leg having a lap connection, non-pivotally anchoring said end to a tray side, the intermediate portions of said resilient members each having reduced cross-sectional area relative*

the cross-sections of said leg ends adjacent said lap connections thereby insuring bending of the resilient members into hairpin shape, said lap connections transferring the forces of said resilient members into the tray sides before and behind said connections whereby resilient members in use exert divergent forces on said trays tending to uniformly press and hold the trays into contact with the user's teeth during opening and closing of the jaws and during lateral and anterior/posterior movements thereof.

Re. 28,668

SILVER HALIDE EMULSIONS CONTAINING ALKYL SELENOLS AND THIOLS AS ANTIFOGGANTS

Arthur H. Herz, Rochester, N.Y., and Edwin R. Westcott, New Smyrna Beach, Fla., assignors to Eastman Kodak Company, Rochester, N.Y.

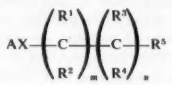
Original No. 3,732,103, dated May 8, 1973, Ser. No. 139,941, May 3, 1971. Application for reissue Apr. 3, 1975, Ser. No. 564,960

Int. Cl.[2] G03C *1/34, 1/48*

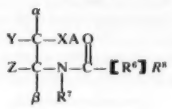
U.S. Cl. 96—76 R **12 Claims**

1. A photographic element comprising a support bearing a light sensitive silver halide-containing layer and, in a concentration of from about 0.005 gram to about 50 grams per mole of silver, an organic compound having the structural formula:

(I)

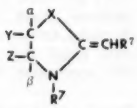


(II)



or

(III)



in which A is a cation selected from the group consisting of hydrogen, sodium, potassium, guanidinium, tetraalkylammonium, and trialkylsulfonium; X is sulfur or selenium; R^1 to R^5 are each hydrogen, an alkyl group having 1 to 6 carbon atoms or a substituted alkyl selected from the group consisting of haloalkyl, hydroxyalkyl and aryl alkyl, provided that at least one of said R^1 to R^5 is a sulfonic acid group or salt thereof; R^6 is hydrogen, an alkyl residue having 1 to 6 carbon atoms, an aryl residue or a halo-, hydroxy-, or aryl-substituted alkyl residue; R^7 is an alkyl residue having 1 to 6 carbon atoms, an aryl residue or a halo-, hydroxy-, or aryl-substituted alkyl residue; α and β are each hydrogen, an alkyl residue having 1 to 6 carbon atoms, an aryl residue, a halo-, hydroxy-, or aryl-substituted alkyl residue or the electrons required to form double bonds between the carbon atoms: *R^8 is an alkyl residue having 1 to 6 carbon atoms, an aryl residue or a halo-, hydroxy-, or aryl-substituted alkyl residue;* Y and Z are each hydrogen, an alkyl residue having 1 to 6 carbon atoms, an aryl residue, a halo-, hydroxy-, or aryl-substituted alkyl residue or together provide the linkage required for completion of a cyclic nucleus selected from the group consisting of phenyl, naphthyl and pyridyl; and m and n are each 0 to 4 and the sum of m and n equals a positive integer up to 8.

Re. 28,669

BI-2-OXAZOLINE AND OXAZINE COMPOUNDS DERIVED FROM CYANOETHYLATED POLY(ETHYLENE GLYCOLS) AND POLY(PROPYLENE GLYCOLS)

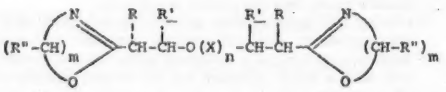
Donald A. Tomalia, and David P. Sheetz, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original No. 3,730,915, dated May 1, 1973, Ser. No. 224,587, Feb. 8, 1972. Division of Ser. No. 129,262, March 29, 1971, Pat. No. 3,763,177, which is a continuation-in-part of Ser. No. 835,910, June 16, 1969, abandoned. Application for reissue Aug. 22, 1974, Ser. No. 499,673

Int. Cl.[2] C08G *59/26*

U.S. Cl. 260—2 N **1 Claim**

1. A latent curable polyepoxide composition comprising in combination, a curable poly-1,2-epoxyalkyl compound having an average of more than one 1,2-epoxyaliphatic group per molecule and a curing amount of [a bi-2-oxazoline derived from cyanoethylated poly(ethylene and propylene) glycols and] *a compound* having the formula



where R, R′ and R″ can be H or alkyl [containing] *of* from one to four carbon atoms, where X is (C_2H_4O) or (C_3H_6O), where n is 1 to 50 inclusive and where m is 2 or 3.

Re. 28,670

Patent Not Issued For This Number

PATENTS

GRANTED DECEMBER 30, 1975

ERRATA

For CLASS	See PATENT NO.
053–022	3,928,938
053–032	3,928,939
053–112	3,928,940
053–182	3,928,941
053–247	3,928,942
102–027	3,929,072
241–055	3,929,236
272–057 R	3,929,335
123–008.47	3,929,402
035–037	3,929,462
209–395	3,929,647
426–580	3,929,890
426–582	3,929,892
260–268	3,930,008
204–258	3,930,151

NOTE-

Albert

U.S. Cl

1. In
fingers
compris
enclose
surface
support
so as to
forming
tially un
tially u
confron
gageme

Albert
9950,

U.S. Cl.

1. A
compris
upper
por
inc
the
lower
bel
low
spring
low

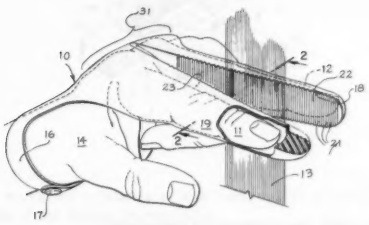
PATENTS

GRANTED DECEMBER 30, 1975

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

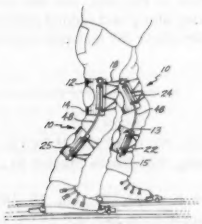
GENERAL AND MECHANICAL

3,928,871
BARBER'S GLOVE AND METHOD
Albert Wall, 515 S. Crescent Ave., Lodi, Calif. 95240
Filed Apr. 17, 1975, Ser. No. 569,104
Int. Cl.² A41D *19/00*
U.S. Cl. 2—161 R **14 Claims**



1. In a glove to be worn by a barber over two adjacent fingers of the hand which controls the hair, the improvement comprising a pair of finger-receiving coverings adapted to enclose said adjacent fingers, said finger coverings having side surfaces disposed in confronting relation to be moved by their supporting fingers into and out of engagement with each other so as to engage and hold strands of hair therebetween, means forming said coverings to cause said surfaces to meet substantially uniformly throughout the length thereof so as to substantially uniformly engage all the hair disposed between the confronting surfaces when said surfaces are moved into engagement.

3,928,872
LEG SUPPORT DEVICE FOR SKIING
Albert F. Johnson, 2509 Blueberry Road, Spenard, Alaska 99503
Filed Sept. 18, 1974, Ser. No. 507,001
Int. Cl.² A41D *13/00*
U.S. Cl. 2—22 **18 Claims**



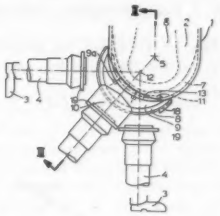
1. A leg support device securable to the leg of a skier, comprising:

upper support means positionable to engage the rearward portion and sides of the skier's leg above the knee, and including means for securing said upper support means to the skier's leg;

lower support means positionable about the skier's leg below the knee, and including means for securing said lower support means to the skier's leg; and

spring means interconnecting the sides of said upper and lower support means, said spring means being in an essentially unstressed condition when the device is thus secured to the skier's leg and the leg is only slightly bent, and being in a stressed condition when the leg and the spring means are relatively sharply bent, which stressed condition tends to relatively straighten said spring means.

3,928,873
ARTIFICIAL LEG
Willem Zevering, Weesp, Netherlands, assignor to Stichting Revalidatie Instituut Muiderpoort, Amsterdam, Netherlands
Filed Feb. 14, 1975, Ser. No. 550,132
Claims priority, application Netherlands, Feb. 20, 1974, 7402290
Int. Cl.² A61F *1/04, 1/08*
U.S. Cl. 3—27 **4 Claims**



1. An artificial leg adapted to be used in cases wherein the natural lower leg has been amputated in the knee joint, comprising a socket member adapted to receive the stump formed by the natural upper leg and provided with a spherical outer surface at its lower end, a crescent-shaped carrier segment directly attached to the lower end of said socket member, having a substantially cylindrical top surface with a radius adapted to the radius of said spherical outer surface and a substantially cylindrical bottom surface having a smaller radius than said top surface, a cylindrical, backwardly sloping guide means provided on said bottom surface and having a radius smaller than the radius of said spherical outer surface, a sliding block slidably mounted on said guide means and forming, together with the same, an artificial knee joint, and an artificial lower leg, connected to and exclusively supported by said sliding block, said carrier segment being dimensioned in such manner that the axis of said guide means is contained within the stump and lies below and behind the center point of said spherical outer surface.

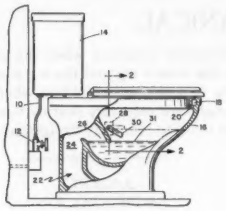
3,928,874
NO-OVERFLOW TOILET
James F. Albertson, 813 Pleasant Lane, National City, Calif. 92050
Filed Oct. 10, 1974, Ser. No. 513,554
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 **9 Claims**

1. An improvement in a commode having a waste evacuation passageway comprising a toilet bowl with a drain line communicating therewith and a fresh water flush system having an outlet into said bowl and valve means to control the flow of water therethrough, said improvement comprising:

a switch assembly mounted on said commode and activated by an abnormally high water condition therein; and

water flow blocking means mounted in said flush system

connected to and operated by said switch to prevent the flow of water therein when said switch assembly is activated by an abnormally high water condition in said commode.



3,928,875

THROW-AWAY RECEPTACLE FOR COLLECTION OF URINE OF THOSE CONFINED TO BED

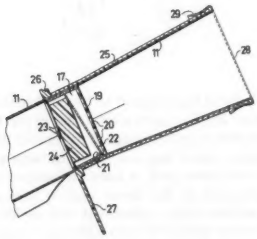
Sture Ivan Persson, 2, Bankogardsgatan, Helsingborg, Sweden (S-252 60)

Filed Feb. 15, 1974, Ser. No. 443,050

Claims priority, application Sweden, Feb. 20, 1973, 7302314

Int. Cl.² A47K *11/12*

U.S. Cl. 4—110 **4 Claims**



1. A throw-away receptacle for the collection of urine of those confined to bed, comprising an elongated flexible bag of tubular foil material one end of which is closed and the other end of which is open, a nonreturn valve for insertion into the open end of said bag, and a comparatively rigid funnel-shaped holder for said bag and valve, said valve including a valve body comprising a sleeve having the same conicity as said holder whereby said sleeve may be wedged into said holder to secure said bag in place between the exterior of said sleeve and the interior of said holder, a perforated cover member extending across one end of said sleeve, a thin membrane disposed within said sleeve adjacent the inner surface of said cover member, a limited portion of said membrane being hingedly attached to said sleeve to permit said membrane to move toward and away from the perforations in said cover member thereby to control the passage of urine through said perforations, a disc-shaped member located within said sleeve between said membrane and the other end of said sleeve for free movement relative to said membrane whereby said member is operative to move said membrane toward said cover member to selectively close said perforations, and an apertured bottom structure extending across the other end of said sleeve for retaining said member within said sleeve while permitting the passage of urine past said member and through said other end of said sleeve into said bag.

3,928,876

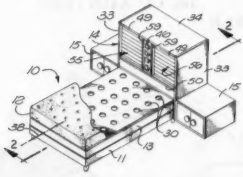
BED WITH CIRCULATED AIR

Louis J. Starr, 1460 S. Norton Ave., Los Angeles, Calif. 90019

Filed Aug. 19, 1974, Ser. No. 498,561

Int. Cl.² A47C *19/00*

U.S. Cl. 5—284 **12 Claims**



1. In a bed, the combination comprising:

a body supporting assembly having a mattress-top surface on which a person using the bed rests and which is cushioned to yieldingly support and be deformed by the user's weight, and is constructed to pass air upwardly through said mattress-top surface to the user's body, said assembly including means forming a chamber or plurality of chambers beneath said surface adapted to conduct a circulation of air and from which said air may flow upwardly through said mattress-top surface and to the user;

a hollow housing at an end of said body supporting assembly communicating with said chamber or chambers beneath the mattress-top surface in a relation delivering air thereto along a first path, said housing having an upper portion projecting upwardly to a level above that of said mattress-top surface and containing an air discharge outlet through which air discharges along a second path at a level above that of said mattress-top surface in a direction to flow over a person lying thereon; and

power driven fan means within said housing at said end of the body supporting assembly and operable to produce two different flows of air from said housing, one being along said first path from the housing through said chamber or chambers and then upwardly through said mattress-top surface to the user, and the second flow being from the housing along said second path and through said discharge outlet above the mattress-top level and over the user's body.

3,928,877

LUG NUT WRENCH TOOL

Robert L. Tregoning, 920 North Market St., Frederick, Md. 21701

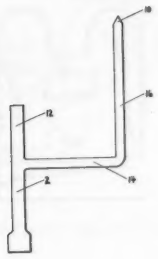
Division of Ser. No. 322,387, Jan. 10, 1973, Pat. No. 3,872,527. This application Jan. 23, 1975, Ser. No. 543,475

Int. Cl.² B25F *1/00*

U.S. Cl. 7—1 G **1 Claim**

1. An automotive tool comprising a straight bar having at one end a socket for a lug-nut and having at an intermediate point along its length an outwardly directed first member extending perpendicularly to the longitudinal axis of the bar and a second member extending from the end of said first member remote from the bar parallel to the longitudinal axis of the bar in a direction away from the socket and terminating at a distance from a plane through said socket perpendicular to the axis of the bar greater than the distance from said plane to the end of said bar remote from the socket, said second

member having a wedge-shaped end for removal of the hub cap, said bar extending on the opposite side of said point from



said socket by a distance at least substantially as great as the width of the normal human hand.

3,928,878

COMBINATION ELECTRICAL CABLE CUTTERS, STRIPPERS AND PLIERS

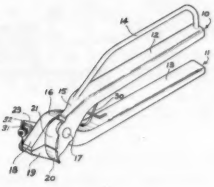
Frederick VanHeuman, 20 Thomas St., Sydney, Australia

Filed Mar. 13, 1974, Ser. No. 450,746

Claims priority, application Austria, Mar. 15, 1973, 2610/73

Int. Cl.² H02G *1/12*; B25F *1/00*

U.S. Cl. 7—5.5 **6 Claims**



1. A combination tool having crossed handles pivoted together with a protection loop extending along, spaced from, and integral with one of the handles, and each handle having an integral jaw formation on one end, having opposed faces, and forming cooperating engaging surfaces whereby movement of the pivoted handles toward each other causes the jaws to move together and vice versa, each jaw formation having on one side, an integral cutting jaw extending generally transversly outwards adjacent the pivot point, and having cutting surfaces which engage upon closing of the jaws, and having an arcuate shape to define a transverse opening in the jaw formation in the closed position, and integral abutment members on the opposite jaw faces having stripper jaws which engage together to form a restricted opening therebetween for stripping the insulation from around an insulated conductor inserted therebetween, said stripper jaws including blade members having cooperating shaped notches which form said restricted opening, headed pins adjustably mounting said blade members on the respective abutment members, and resilient means on one of said pins and engaging a blade member.

3,928,879

INFLATABLE TUBE BODIES

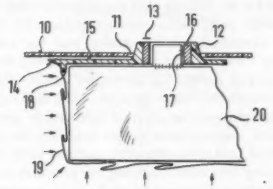
Horst Britschinn, Munich; Fritz Federer, Turkenfeld, and Henning Neumann, Germering, all of Germany, assignors to Metzeler Kautschuk AG, Munich, Germany

Filed Feb. 11, 1975, Ser. No. 549,072

Claims priority, application Germany, Feb. 15, 1974, 7405362[U]

Int. Cl.² B63B *35/00*

U.S. Cl. 9—400 **19 Claims**



1. In an inflatable arrangement, particularly for use in inflatable boats, life-saving buoys, bathing platforms and like buoyant elements, a combination comprising an inflatable tube having an opening and flexible wall portions defining an interior space when inflated; a rigid container positioned within said interior space and having an access port requiring to be secured in a predetermined position within said opening; elastic, impermeable retaining means provided within said space and partially surrounding said container for pressure-tightly securing said container in said predetermined position under the influence of the internal inflation pressure in said tube; and preventing means for preventing deformation of said flexible wall portions of said tube in the region adjacent said rigid container, said preventing means comprising a flange portion secured to the interior surface of said flexible wall portions and maintaining said rigid container out of contact with the latter.

3,928,880

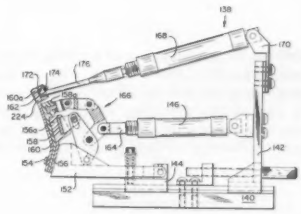
LASTING MACHINE HAVING FLEXIBLE LASTING STRAP

Sinville Runions, Booneville, Miss., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Mar. 27, 1975, Ser. No. 562,700

Int. Cl.² A43D *21/12*

U.S. Cl. 12—8.2 **2 Claims**



1. A lasting machine, operable on a selected portion of a shoe assembly formed of a last having an upper mounted thereon and an insole located on its bottom by wiping the corresponding portion of the margin of the upper against the corresponding portion of the insole, comprising: support means for supporting the shoe assembly bottom-up with said margin portion extending upwardly of said insole portion; a lasting strap, located outwardly of said upper portion, having a relatively rigid top segment and a relatively flexible remainder extending downwardly of said top segment, said top seg-

ment and said remainder being joined by a juncture; a nozzle located upwardly of the shoe assembly and mounted for movement in a cement applying stroke along the corner between said margin portion and the periphery of said insole portion; resilient means so bearing against at least a part of the support means as to yieldably urge said shoe assembly portion upwardly; means for causing the lasting strap to so engage said upper portion as to cause said lasting strap remainder to press said portion of the upper against the last with said top segment extending upwardly of said insole portion and with said juncture located below the upwardly facing bottom of said insole portion; means for so folding said top segment that it extends part way towards said insole portion; means for thereafter effecting said cement applying stroke and for causing the nozzle to apply cement into said corner during the cement applying stroke; and means for thereafter further folding said top segment towards the insole so as to cause said top segment to wipe said margin portion against said insole portion in a wiping operation, said resilient means enabling the part of the last that is part of said shoe assembly portion to be depressed during said wiping operation to bring the juncture to the level of the upwardly facing bottom of said insole portion.

3,928,881

METHOD AND MOULD FOR THE MANUFACTURE OF A PLASTIC SOLE FOR SHOES

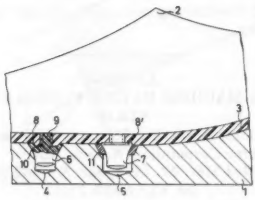
Alfred Bente, Herzogenaurach, Germany, assignor to Adolf Dassler, Herzogenaurach, Germany

Filed July 5, 1974, Ser. No. 485,815

Claims priority, application Germany, Aug. 1, 1973, 2338942; Feb. 21, 1974, 2408444

Int. Cl.² A43D *9/00*; **A43C** *15/00*

U.S. Cl. 12—142 R **6 Claims**



1. A method for the manufacture of a plastic material outsole for shoes, especially sports shoes, with exchangeable screw-in gripper elements, having screw-threaded extensions, said method comprising the steps of locating the screw-threaded gripper elements in a mold cavity and thereafter introducing plastic material directly round the screw-threaded extensions.

3,928,882

PORTABLE RAMP

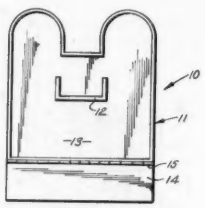
Marie Miland, Watertown, Minn. 55388

Filed Dec. 11, 1972, Ser. No. 268,000

Int. Cl.² E01D *15/12*

U.S. Cl. 14—72 **3 Claims**

1. A board device for enabling wheel chair patients to weigh themselves upon a scale, comprising, an aluminum main body providing platform means for the wheel chair, a balance weight carried by said main body providing balance means to said main body, rail means carried by said main body providing preventive means for the wheel chair from accidentally rolling off of the top side of said main body of said device, a



ramp carried by said device providing easy ascending and descending of wheel chair.

3,928,883

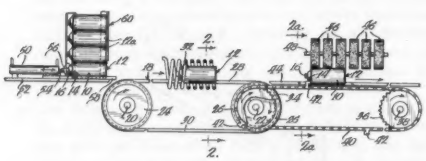
APPARATUS FOR REMOVAL OF LITHOGRAPHY FROM METAL SURFACES

Joseph J. Gregory, 1929 Stratford Ave., Westchester, Ill. 60153, and Jack R. Randolph, Phoenix, Ariz. 85000

Continuation-in-part of Ser. No. 302,495, Oct. 31, 1972, Pat. No. 3,801,369. This application Jan. 16, 1974, Ser. No. 433,681

Int. Cl.² A46B *13/02*

U.S. Cl. 15—4 **7 Claims**



1. Apparatus for removing lithography from the cylindrical outer surface of a container comprising conveyor means for moving said container axially along its outer surface, means for heating the container substantially uniformly while being thus moved to a temperature sufficient to soften the lithography without disturbing the structure of the container, brush means for brushing the cylindrical surface of the container while it is being moved, and means to allow rotation of said container while being brushed by said brush means.

3,928,884

APPARATUS FOR CLEANING A ROTATING BRUSH

Hanspeter Sutter, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Feb. 6, 1975, Ser. No. 547,712

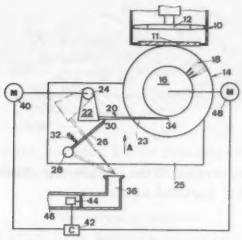
Claims priority, application Switzerland, Feb. 15, 1974, 2128/74

Int. Cl.² A46B *13/02*

U.S. Cl. 15—21 D **7 Claims**

1. An apparatus for cleaning a rotating brush, especially at a textile machine, comprising a movable cleaning comb operatively engaging with said brush, a relatively movable stripper operatively associated with said cleaning comb, drive means

for generating the movements between the cleaning comb and brush and between the stripper and the cleaning comb, and



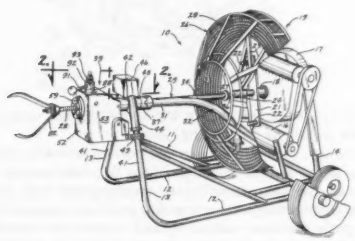
pneumatic means for conducting away stripped-off contaminants.

3,928,885

PIPE CLEANING MACHINE AND CABLE RETRIEVING MECHANISM THEREFOR

Henry G. Peterson, West Des Moines, and Tom Grimes, Altoona, both of Iowa, assignors to Roto Rooter Corporation, West Des Moines, Iowa

Filed Jan. 27, 1975, Ser. No. 544,063
Int. Cl.² B08B *9/02*
U.S. Cl. 15—104.3 SN **6 Claims**



1. In a pipe cleaning machine having a frame, a reel for a coiled spring cable rotatable on said frame, power means on said frame for rotating said reel in one direction, and a cable guide tube rotatable on said frame having one end portion coaxial with the axis of said reel and an opposite end portion extended within and terminating adjacent the outer peripheral surface of the reel; a cable retrieving mechanism comprising:

a. a housing fixed on said frame adjacent the one end portion of said guide tube having a pair of oppositely arranged end walls,

b. a tubular shaft rotatably supported on and extended through one of said end walls in a coaxial relation with said reel, said other end wall having a cable receiving opening in axial alignment with said shaft with the length of cable within said opposite end portion of the guide tube and coiled within said reel providing for the rotation of the guide tube with said reel,

c. means coupling said tubular shaft with the one end portion of the guide tube for rotation with said guide tube,

d. a cable feed means in said housing movable into and out of engagement with a cable to move the cable in only one direction through said end wall opening into said housing and axially through said tubular shaft into said guide tube for coiled reception within said reel, and

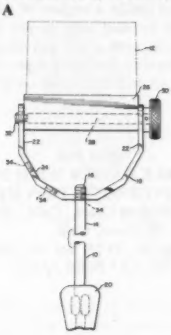
e. means connecting said tubular shaft in continuous driving engagement with said cable feed means.

3,928,886

PAINT BRUSH

Frank Marino, 1593 Wales Ave., Baldwin, N.Y. 11510, and Thomas D. Hadnagy, 17 Briar Lane, Roslyn Heights, N.Y. 11577

Filed Mar. 1, 1974, Ser. No. 447,063
Int. Cl.² A46B *5/00*; **B25G** *1/06*, *3/30*
U.S. Cl. 15—144 A **2 Claims**



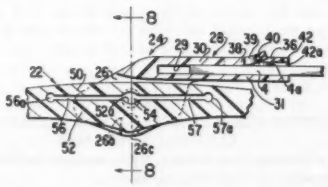
1. A paint brush comprising: a plurality of bristles; clamp means securing said plurality of bristles at one end thereof; a U-shaped yoke having opposed generally parallel spaced sides, an arcuate section of said yoke connecting said sides; screw means operatively associated with said sides and said clamp means for removably securing said clamp means to said yoke between said sides in variable angular relationship; a plurality of identical threaded openings formed in said arcuate section; a handle and a threaded end of said handle for selective threaded engagement of said handle with one of the threaded openings of said plurality said screw means being an elongated pin which passes between and through said sides, and said clamp means is provided with a pin receiving opening through which said pin is passed.

3,928,887

WINDSHIELD WIPER COUPLING STRUCTURES

Manuel Lopez, Trumbull, and Joseph R. Bourassa, Huntington, both of Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.

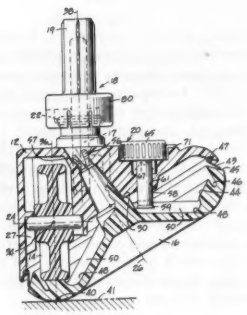
Filed Oct. 1, 1973, Ser. No. 402,402
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **10 Claims**



1. In a windshield wiper blade holder including a resilient molded primary bow member carrying thereon means for holding a flexible windshield wiping blade in working relation thereto and means on a central portion of said bow member for coupling it with the end of a windshield wiper arm, the improvement wherein said coupling means comprise a connector which is a unitary molded body forming a saddle portion straddling said central portion and forming a tubular coupler portion protruding from said saddle portion along and over said central portion, said coupler portion defining an

elongate socket to receive snugly, and defining a latch to interlock detachably with a detent protruding laterally from, said arm end when said arm end is of the bayonet mounting type, coacting means integral respectively with side panels of said saddle portion and opposite sides of said central portion for holding said connector pivotally yet detachably on said central portion, and means including a transverse socket integrally formed by and inside a region of said central portion normally obstructed by said side panels for receiving and interlocking detachably with a side pin of said arm end when said arm end is of the side mounting type, whereby the blade holder is attachable to an serviceable on a wiper arm end of either of said types.

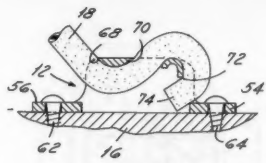
3,928,888
INTERCHANGEABLE CASTER WITH INCLINED AXLE AND LINT PROTECTION MEANS
Sidney D. Lapham, Walnut Creek, Calif., assignor to Lapham Engineering, Inc., Martinez, Calif.
Filed Aug. 30, 1974, Ser. No. 502,180
Int. Cl.² B60B *33/00*
U.S. Cl. 16—35 R **16 Claims**



15. In a carpet caster having a bearing block mounted for swiveling movement on a stem about a generally vertical axis, a roller journaled in said block on a generally horizontal axis, and a dished disc journaled in said block on an inclined axis and having formed therein an annular track surface on which said roller rides, the improvement comprising the axis of said stem being positioned at the apex of a substantially isosceles triangle whose base is the distance between the center of said roller and the bearing point of said dished disc, and whose sides are greater than said base but whose apex is inside the perimeter of said dished disc as seen in plan view.

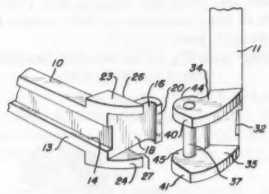
3,928,889
COMBINATION BRACKET AND ELASTOMERIC ELEMENT THEREFOR
George Wartian, East Detroit, Mich., assignor to Wartian Lock Company, St. Clair Shores, Mich.
Filed Jan. 6, 1975, Ser. No. 538,765
Int. Cl.² E05F *1/08*
U.S. Cl. 16—74 **3 Claims**

1. The combination of a bracket and elastomeric element therefor, said bracket comprising a body having at least three walls, a first entrance opening in one of the walls, an exit opening in a second wall adjacent said one wall, a second entrance opening in the third wall, said first entrance opening being in communication interiorally of said body with said exit opening, one end of said elastomeric element being inserted first into said first entrance opening, thence out of said exit opening and thence into said second entrance opening whereby said one end of the elastomeric element is configured in a hook shape which is resistant to extraction from the



bracket when the portion of the elastomeric element exteriorally of the bracket is pulled upon.

3,928,890
DRAPERY SUPPORTING LINKAGE
George H. Baker, Sr., Dunlap, Ill., assignor to Baker Drapery Corporation, Peoria, Ill.
Continuation-in-part of Ser. No. 332,711, Feb. 15, 1973. This application May 20, 1974, Ser. No. 471,339
Int. Cl.² E05D *13/02*
U.S. Cl. 16—87.2 **14 Claims**

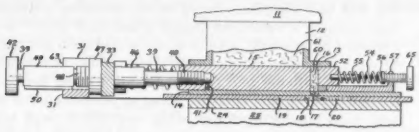


1. An accordian linkage for a drapery support, comprising:
first link means having an end portion,
second link means having an end portion pivotally interconnected to said end portion of the first link means,
each of said link means having an elongated body portion, means pivotally interconnecting said link means including a male member carried by and supported adjacent the end of one of the link means and a female member receiving said male member and carried by and supported adjacent the end of the other link means,
one of said members being formed integrally with the associated body portion, a projection formed integrally with and extending axially from at least one of said body portions to limit pivotal movement of said first and second link means, said one of said members being supported completely independently of said projection.

3,928,891
MOLDING APPARATUS
Harry H. Holly, Olympia Fields, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.
Filed Apr. 14, 1972, Ser. No. 244,027
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 **3 Claims**

1. Molding apparatus, comprising: supply means for retaining a supply of pressure flowable moldable material; compression chamber means for said material from said supply; a mold adjacent to said compression chamber means having a shaping cavity therein; passage means communicating between said compression chamber and said cavity for pressure flow of material from said chamber and through said passage into said mold cavity; pressure means for applying pressure to said material in said chamber; a pressure movable piston in said compression chamber; means mounting the piston for movement under increasing pressure transmitted through said ma-

terial in the compression chamber; and a closure valve mounted on said piston, the piston thereby comprising valve



operating means activated by the pressure of said material in the chamber for opening the valve.

3,928,892

APPARATUS FOR REMOVING WASTE FROM A BLOWING ROOM MACHINE

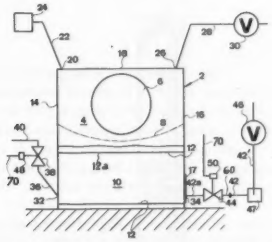
Johann Walter Ferri, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed June 21, 1974, Ser. No. 481,832

Claims priority, application Switzerland, June 28, 1973, 9413/73

Int. Cl.² D02J *7/00;*

U.S. Cl. 19—200 **8 Claims**



1. An apparatus for removing waste from a blowing room machine, said blowing room machine comprising a work zone, a collecting compartment for the waste arranged neighboring said work zone, and means for conjointly enclosing in an essentially airtight manner said work zone and said collecting compartment, a blower having a suction side, a pneumatic transport conduit for conveying cleaned fibers operatively connecting in flow communication the work zone with the suction side of said blower, means defining an infeed opening for the fibers to be cleaned communicating with said work zone, means defining an air inlet opening for the collecting compartment, means defining an air outlet opening for said collecting compartment, a first shutoff element for controlling the air inlet opening, means connecting said first shutoff element with said air inlet opening, a second shutoff element for controlling the air outlet opening, means connecting said second shutoff element with said air outlet opening, a further blower having a suction side, means for connecting said second shutoff element with the suction side of said further blower, and means for periodically opening and closing both of said shutoff elements.

3,928,893

BAG FASTENER

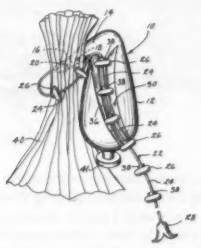
Robert L. Schmoller, 1016 Glenn Drive, Waukesha, Wis. 53186

Filed Mar. 11, 1974, Ser. No. 449,890

Int. Cl.² B65D *77/10, 63/00*

U.S. Cl. 24—30.5 **10 Claims**

1. A bag fastener comprising a fastening element with a main body portion having a longitudinal axis and having upper and lower ends and having a horn portion projecting laterally outwardly and transversely of the longitudinal axis of the body portion, said horn portion having a projecting end, an elongated flexible member attached to the projecting end of said horn portion, engaging means on said body portion extending from said horn to the lower end of the body, and means on said flexible member cooperating with said engaging means for releasably securing a part of the flexible member to said



body portion while a portion of the length of the flexible member which is between the horn and body portion is looped around the neck of the bag, said horn forming an angle with the body portion adjacent said engaging means and being positioned to cause self-engagement of the flexible member with the engaging means when the fastening element is swung around the neck of a bag.

3,928,894

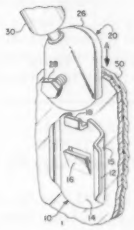
ADHESIVE MOUNTING DEVICE

George John Bury, Lake Villa, and Edwin Grant Swick, Bartlett, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 26, 1974, Ser. No. 527,331

Int. Cl.² A44B *21/00;* **A47G** *1/16*

U.S. Cl. 24—73 VA **11 Claims**

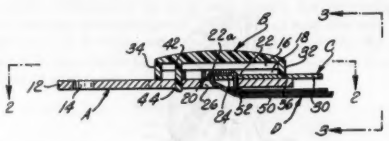


1. A system for mounting devices to a primary workpiece including a base plate member having one surface adapted to be adhesively secured to the primary workpiece through an adhesive bonding layer, opposing side edges of the base member including shoulder surface means in spaced relationship to the said one surface, a mounting member adapted to be slidably positioned over the base plate, the mounting member including lip portions extending inwardly from the opposite side edges thereof to underlie the shoulder surface means when associated therewith, the opposing lip portions and shoulder surface means forming a first set of opposing clamping surfaces, the means to clamp the mounting member being adapted to bear against a predetermined region of the base plate and thereby forming a second set of opposing clamping surfaces, spring means positioned between at least one set of opposing clamping surfaces and adapted to relieve the stress on the adhesive bonding layer when the system is mounted on the primary workpiece as a result of the clamping pressure between the two members as well as preloading the system.

3,928,895
ADJUSTABLE STRAP FASTENER

Wolf-Dieter Klink, Alfdorf, Germany, assignor to Repa Feinstanzwerk GmbH, Industriegebiet, Germany

Filed Aug. 19, 1974, Ser. No. 498,448
Int. Cl.² A44B 11/10
U.S. Cl. 24—196 9 Claims

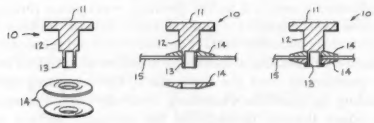


1. An adjustable strap fastener comprising; a housing defining a cavity having a belt access opening thereto, said housing including a base plate and a cover member, said base plate having opposite reversely bent edges providing channels having opposed facing grooves defining a guideway in said housing, said cover member being of plastic material and having front and rear depending flanges extending perpendicular to said grooves and spaced apart a distance slightly less than the length of said channels, said flanges being in resilient gripping engagement with the opposite ends of said channels, said cover member having an integral plastic spring support extending downwardly therefrom in spaced relationship to said rear flange through a hole in said base plate, a substantially flat slider plate slidably received in said guideway and having a single clamping bar, a strap extending through said access opening in said housing and around said clamping bar, biasing means for biasing said slider plate to a strap clamping position wherein the strap is clamped between opposed edges of said clamping bar and said access opening, said biasing means comprising an arcuate leaf spring stressed between said spring support and the rear end of said slider plate, said housing further defining a release tab opening, said front flange having a terminal end spaced from said base plate a distance slightly greater than the thickness of said slider plate to define said release tab opening, and an integral release tab on said slider plate projecting outwardly of said cavity through said release tab opening, said release tab being positioned for application of manual force thereto for sliding said slider plate away from said clamping position against the force of said biasing means.

3,928,896
FASTENER

Brian C. Puckett, 5490 Braes Valley No. 410, Houston, Tex. 77035

Filed Dec. 18, 1974, Ser. No. 533,934
Int. Cl.² A44B 17/00
U.S. Cl. 24—224 4 Claims



1. A positive lock device for fastening together adjacent sections of material, said device comprising:

a. a male portion adapted to be fixed to a first portion of said material, said male portion including means permitting it to be so affixed to said material first portion, and further including a narrow, slot-engaging stem connected to an enlarged portion;

b. a female portion adapted to be fixed to a second portion of said material, said female portion including an interior chamber, a plate having an aperture therethrough, said aperture having an enlarged portion and a narrow slot leading transverse therefrom, said aperture communicating with said chamber, spring means including a pair of legs forming a restricted orifice positioned within said chamber between the area underlying said enlarged aperture portion and the area underlying said narrow slot, and means for affixing said female portion to said material second portion, said aperture being so positioned that on said male enlarged portion being inserted through said aperture and said stem moved through said orifice, forces tending to separate said adjacent material sections will be opposed by said narrow slot.

3,928,897
DEVICE FOR FASTENING WALL COVERING FABRICS

Gerard J. Tombu, 8, Rue des Bouchers, F-02 Saint-Quentin, France

Filed Aug. 13, 1974, Ser. No. 497,075
Claims priority, application France, Aug. 2, 1974, 74.26918
Int. Cl.² A44B 21/00; A47H 23/00
U.S. Cl. 24—243 K 6 Claims

1. A device for fixing and stretching wall fabrics, comprising: a sole piece in the form of a flat strip adapted to be secured to a wall, the side edges of said flat strip being curved toward each other forming at each side of said flat strip a hooking groove, one of the hooking grooves having a larger curve radius than the other of the hooking grooves; and a shaped section comprising a hollow rib portion having a relatively narrow entry opening, a wing portion extending outwardly from each side of the entry opening of said hollow rib portion, the lengthwise edges of the wing portions being curved toward each other forming at each side of the shaped section a hooking element, the curve radius of one of the hook elements corresponding to that of said one hooking groove and the curve radius of the other hooking groove corresponding to that of the other said hooking groove, the shaped section being dimensioned to be inserted in the sole piece with the hooking elements of the shaped section disposed within the corresponding hooking grooves of the sole piece for securing fabric between said sole piece and said shaped section, whereby held fabric extending from between said one hooking groove and one hooking element and over the device is spaced above said other hooking groove and hooking element.

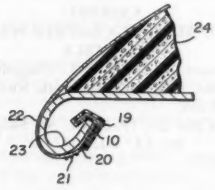
3,928,898
UPHOLSTERY ATTACHER

Edward H. Smoot, Holcomb, N.Y., assignor to The Schlegel Manufacturing Company, Rochester, N.Y.

Continuation of Ser. No. 336,918, March 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,307, May 1, 1972, abandoned. This application Sept. 16, 1974, Ser. No. 506,740

Int. Cl.[2] A47C *27/00*; **A44B** *21/00*

U.S. Cl. 24—259 FS **14 Claims**



1. An upholstery attacher comprising:

a. a substantial length of flexible, non-stretchable carrier material that is both bendable and twistable and is formed into a self-maintaining hook shape in cross section continuously throughout said substantial length;

b. a continuous flange of a separate and generally plane and flexible material secured to said carrier and extending away from the shank portion of said hook shape along said substantial length of said carrier material;

c. means for fastening a peripheral edge of said upholstery to said flange along the entire longitudinal length of said flange;

d. a support edge extending along a cushioned body to be upholstered and along said peripheral edge of said upholstery;

e. said upholstery being shaped for covering said cushioned body and said peripheral edge of said upholstery extending to within a predetermined distance from said support edge; and

f. said hook shape being sized and formed of a material having sufficient strength to hook over and maintain a position following along said support edge along the substantial length of said carrier material, and said flange having sufficient strength to pull said upholstery evenly over said cushioned body and closer to said support edge and to hold said upholstery tightly in place.

3,928,899
YARN CUTTING-OFF MACHINE

Günter Maiworm, Schontaler Weg 22, 5982 Neuenrade, Germany

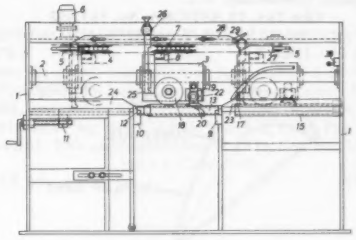
Filed Apr. 4, 1975, Ser. No. 565,108

Claims priority, application Germany, Apr. 17, 1974, 2418492

Int. Cl.[2] D03D *45/58*

U.S. Cl. 28—19 **22 Claims**

1. A machine suitable for cutting yarn residue off yarn tubes comprises bearing means to support a yarn tube, a cutter carriage having a cutting knife thereon and arranged to be moved relative to the yarn tube in a cutting pass, so as to cut residual yarn from the yarn tube by means of said cutting knife, and in a return pass, a driving dog and means to hold the driving dog clear of the yarn tube during the cutting pass of the cutter carriage and to engage the driving dog with the yarn



tube on the return pass of the cutter carriage so as to eject the yarn tube from the bearing means.

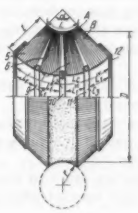
3,928,900
ROTATING CUTTING TOOL

Viktor Samsonovich Salukvadze, and Larisa Viktorovna Salukvadze, both of 5 Parkovaya ulitsa, 42, kv. 53, Moscow, U.S.S.R.

Filed Dec. 16, 1974, Ser. No. 533,064

Int. Cl.[2] B26D *1/12*

U.S. Cl. 29—105 R **2 Claims**

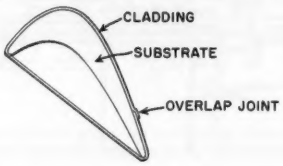


1. A rotating cutting tool for surface machining of articles and materials, comprising at least two sets of radially arranged cutter members constituted by pieces of wire of the same length; said cutter members fastened together at one of the ends thereof, and said cutter members being pressed against each other at the fastened ends along the side surfaces thereof; free cutting tips of said cutter members opposite to said fastened ends forming a common working surface of the tool in the shape of a surface of revolution; the ratio of the sum of face areas of the free cutting tips of the wire pieces on the working surface of the tool is 0.10 to 0.99; ring-type packings each of which is installed between each pair of said sets of cutter members near said fastened ends thereof; said ring-type packings have such a thickness and are so installed that the working surface of the tool formed by said cutting tips of said cutter members has a curvilinear shape in cross-section, the curvature of the working surface of the tool being substantially equal to the curvature of the surface being machined in cross-section; said cutter members are so disposed at the site of contact with the surface being machined that, being in a free state, they are in substantially normal relationship with the surface being machined.

3,928,901
FORMING A CLADDING SHEET TO A CONVEX/CONCAVE SUBSTRATE

William F. Schilling, Schenectady, and Adrian M. Beltran, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,852
Int. Cl.² B23P *15/04;* **B21K** *3/04*
U.S. Cl. 29—156.8 B **6 Claims**



1. A method of preforming a sheet cladding to a substrate having a concave-convex surface, the method comprising the steps of:

a. rough forming the sheet cladding to the substrate so that the sheet cladding closely abuts the convex surface of the substrate while the sheet cladding opposite the concave surface of the substrate is spaced from the concave surface including:

i. fastening one edge of the sheet cladding to the convex surface of the substrate;

ii. joining the other edge of the sheet cladding to the one edge of the sheet cladding to define a seam on the convex surface of the substrate;

3. A method of preforming a sheet cladding to a substrate having a convex-concave surface, the method comprising the steps of:

a. rough forming the sheet cladding to the substrate so that the sheet cladding closely abuts the convex surface of the substrate while the sheet cladding opposite the concave surface of the substrate is spaced from the concave surface;

b. placing the sheet cladding and substrate assembly into a sealed rubbery mold including:

i. inserting the rubbery mold into a rubbery sleeve;

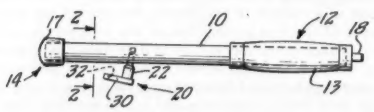
ii. sealing each end of the rubbery sleeve with an end plate and clamp; and,

c. applying isostatic pressure to the mold to deform the sheet cladding into contact with the substrate concave surface.

3,928,902
TOOL FOR TUBELESS TIRE VALVES

Warren J. Seims, Freeport, and Gabor Farkas, Stony Point, both of N.Y., assignors to Acme Air Appliance Co., Inc., Hackensack, N.J.

Filed Dec. 4, 1974, Ser. No. 529,455
Int. Cl.² B25P *19/04*
U.S. Cl. 29—221.5 **7 Claims**

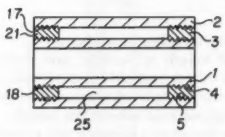


1. A tool for installing a valve for a tubeless tire in or removing it from the valve hole of a tire rim, said valve having a stem extending at least partly through said hole and formed with an externally threaded end, comprising a bar presenting a handle portion at one end thereof and having at a location away from said one end a fulcrum portion adapted to be seated against a portion of said rim, and a valve gripping foot depending from said bar at a location spaced away from both said handle portion and said fulcrum portion, said foot comprising an ankle post fixed to said bar and a foot plate projecting laterally from said post, said foot plate containing an aperture extending therethrough and of sufficient diameter to be passed over said stem end, said aperture being bordered at its opposite sides as viewed lengthwise of said bar by oppositely directed ridges which are spaced apart in the axial direction of the aperture and which are engageable between threads on said stem end so as to grip said stem end and lift it for displacement of said valve by a tilting movement of said bar and said gripping foot about a seated location of said fulcrum portion on said rim.

3,928,903
METHOD OF MAKING A DOUBLE-WALLED PIPE ASSEMBLY

Bart D. Richardson, and Michael L. Waggoner, both of Anchorage, Alaska, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 29, 1975, Ser. No. 545,011
Int. Cl.² B23Q *17/00*
U.S. Cl. 29—407 **3 Claims**

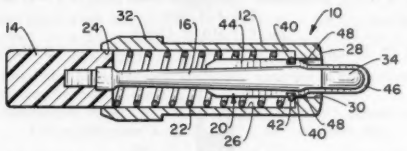


1. A method for making a double-walled pipe assembly for use in a permafrost zone in a wellbore in the earth comprising providing two sections of pipe, the first pipe being of smaller outside diameter than the inside diameter of the second pipe so that the first pipe can be inserted into the second pipe and the outer wall of the first pipe spaced from the inner wall of the second pipe to provide an annulus between said pipes, a first end of each of said first and second pipes being threaded, said threads being in the same rotational direction, said first ends being threadably joined by a first connector means, said first connector means being of sufficient size so that it forms an essentially rigid connection between said first and second pipes, the length of the threaded portions on the first ends of said pipes and said first connector means being sufficient to withstand the force requirements to which said assembly is expected to be subjected, threading the outer surface of the second end of said first pipe and the inner surface of the second end of said second pipe, said threads being in the same rotational direction, said threads starting at the same relative points on said second ends of said pipes, marking the thread start points on the second ends of both pipes, providing a second connector means which when threaded will fit into the annulus between said second ends, threading said second connector means on its inner and outer surfaces so the inner thread will mate with the thread on the outer surfaces of said first pipe and the other thread will mate with the thread on the inner surface of said second pipe, said second connector means being of a size and threaded portion length essentially equivalent to said first connector means, starting the threads on the inner and outer surfaces of said second connector means at the same point and marking that point of thread starting, aligning the thread start mark on said second connector means between the thread start marks on the second ends of said pipes and screwing said second connector means into the annulus.

3,928,904
FASTENING DEVICE

Sterling B. Jones, 858 Duff Ave., West Covina, Calif. 91790

Filed Feb. 28, 1975, Ser. No. 554,153
Int. Cl.² F16B 13/06
U.S. Cl. 29—436 6 Claims



4. A method of making a fastening device comprising the steps of:

forming a tubular housing having an open end and a closed end;

forming an aperture in said closed end;

inserting the base of a pair of spreadable pins within a cap so said pins are under continuous bias toward each other;

locating a spreader bar between said pins aft of the head area of said pins;

locating a compressible spring about said spreadable pins between said cap and said closed end;

placing said spreadable pins within said tubular housing with the head area of said pins to extend through said aperture;

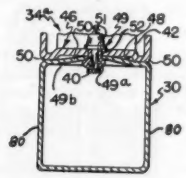
forcibly moving said cap within said open end causing said spreader bar to move between the head area of said pins causing securing of said spring to a connection means formed on said spreader bar; and

releasing said cap resulting in said cap being retained within said housing by the head area of said pins not being movable back through said aperture due to said spreader bar being located between the head area of said pins.

3,928,905
METHOD OF ASSEMBLY FOR KNOCK-DOWN STORAGE FRAME

Wayne G. Atwater, Willoughby, Ohio, assignor to The Triax Company, Cleveland, Ohio

Continuation of Ser. No. 484,427, July 1, 1974, abandoned, which is a division of Ser. No. 301,528, Oct. 27, 1972, Pat. No. 3,840,124. This application Mar. 6, 1975, Ser. No. 555,800
Int. Cl.² B23P 11/02
U.S. Cl. 29—446 12 Claims

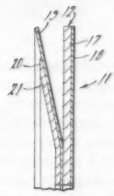


1. In a method of making a rigid connection in a structural unit such as a storage frame or the like, comprising, providing a generally vertically oriented load supporting column member, providing a connecting member in generally laterally extending abutting relation to said column member for connection to the latter by actuatable fastener means, at least one of said members at the connection comprising a deformable web, said web being adapted for coaction with said fastener means with at least a fastener receiving portion of said web spaced from the other of said members, coupling said connecting member to said column member by said actuatable fastener means and deforming said web outwardly adjacent said fastener means, and toward said other member by actuation of said fastener means, to accomplish prestressing of said web of said one member whereby the rigidity of said connection is enhanced.

3,928,906
METHOD OF MAKING A TURBINE REGENERATIVE SEAL

William E. Good, Cinnaminson, N.J.; Leonard Di Grasso, Philadelphia, Pa., and James D. Hoffman, Santa Monica, Calif., assignors to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 231,975, March 6, 1972, Pat. No. 3,761,101. This application Mar. 8, 1973, Ser. No. 339,123
Int. Cl. C23c 7/00
U.S. Cl. 29—460 9 Claims

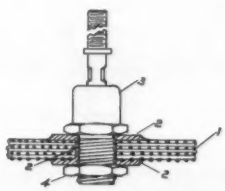


1. The method of applying a wear resistant coating to a metal substrate for forming a compliant seal comprising the steps of forming a metal oxide layer on the portion of the substrate to be coated, depositing a transition coating of nickel aluminide on the oxidized surface, the transition coating of nickel aluminide being capable of exothermically reacting with the metal oxide layer to form an effective surface bond, exothermically reacting the nickel aluminide transition coating with the metal oxide layer and depositing a wear resistant metal oxide coating on the transition coating.

3,928,907
METHOD OF MAKING THERMAL ATTACHMENT TO POROUS METAL SURFACES

John Chisholm, 3 River Terrace Lane, Jupiter, Fla. 33458

Continuation-in-part of Ser. No. 200,079, Nov. 18, 1971, abandoned. This application Oct. 17, 1973, Ser. No. 407,299
Int. Cl.² B05B 7/20; B32B 15/20; H01L 21/48
U.S. Cl. 29—527.4 7 Claims

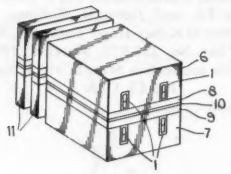


3. The process of providing a heat transfer connection at selected regions of a porous metal panel comprising the steps of masking surrounding surface areas of the panel which are to be left untreated; filling in the interstices of the porous metal panel surface within said regions by spraying on molten, high thermal conductivity metal; smoothing the filled-in surface areas; similarly treating the opposed surface of said metal panel at said regions; and providing at least one through hole between the opposed filled-in panel surfaces.

3,928,908
MANUFACTURE OF MAGNETIC HEADS

Derek Frank Case, 122 Cadbury Rd., Sunbury-on-Thames, England

Filed Dec. 7, 1973, Ser. No. 422,684
Claims priority, application United Kingdom, Dec. 29, 1972, 60152/72
Int. Cl. H01f 7/06
U.S. Cl. 29—603 3 Claims

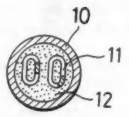


1. A method of manufacturing a transducing head for use in conjunction with a magnetic recording medium, the head having a working face arranged to be positioned in use adjacent the medium to co-operate therewith, the method including the steps of assembling a pair of electrically non-conductive ferrite elements and a non-magnetic spacer so as to provide at the working face magnetic pole pieces separated by the non-magnetic spacer the latter defining a transducing gap; depositing an electrically conductive layer over the assembled ferrite elements to provide a closed electrically conductive loop about an axis substantially perpendicular to the working face and such as to circumscribe only the pole pieces and the transducing gap at least in the vicinity of the working face, forming a non-magnetic block grooved to receive the assembled elements; inserting the assembled elements with the conductive layer thereon into the groove with the spacer between the ferrite elements layer parallel to the axis of the groove; applying a plate of non-magnetic material to bridge the groove; and bonding the elements in the block and the plate to form an assembly having a face in which the ferrite elements are separated by the transducing gap and surrounded by non-magnetic material.

3,928,909
METHOD FOR PRODUCING CARTRIDGE HEATERS

Isamu Saku, Aichi, Japan, assignor to Kabushikikaisha Kawaidenkiseisakusho, Nagoya, Japan

Filed July 12, 1974, Ser. No. 487,958
Claims priority, application Japan, July 12, 1973, 48-78603
Int. Cl.² H05B 3/00
U.S. Cl. 29—611 3 Claims

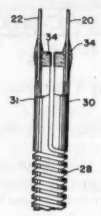


1. A method for producing cartridge heaters, which includes the steps of inserting a going and returning heating coil of a circular cross-section within a heat-resisting cover pipe with an elliptical cross-section, the cross-section of the going and returning portions of the heating coil being aligned along the longer axis of the elliptical cross-section of said cover pipe, charging powdered insulator in the region within the cover pipe not occupied by said heating coil and reducing said longer axis by compressing said cover pipe along said longer axis to deform the cross-section into a less eccentric ellipse and the cross-section of said heating coil into an elliptical one having its longer axis perpendicular to the direction of compression.

3,928,910
GAS IGNITER

Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Division of Ser. No. 290,256, Sept. 18, 1972, Pat. No. 3,842,819, and a continuation-in-part of Ser. No. 223,451, Feb. 4, 1972, abandoned. This application June 3, 1974, Ser. No. 475,389
Int. Cl.² H01R 43/00
U.S. Cl. 29—628 8 Claims

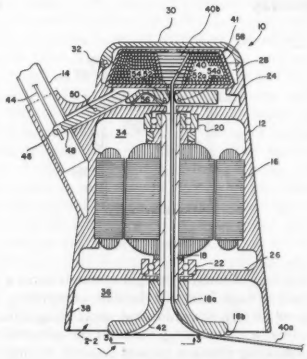


1. The improvement in the method of connecting an energizing lead to a high temperature gas igniter, that comprises the steps of providing said lead with an appreciable uninsulated terminal portion and said igniter with a conductive extension of the same, bringing said uninsulated terminal portion of said lead into appreciable generally longitudinal direct interengagement with a surface of such igniter extension, and holding said uninsulated terminal portion of said lead and igniter extension in such interengaged relation while applying thereto a metallizing spray fully covering the interengagement of the two, so that the metallizing spray bonds the lead to the igniter extension, the material thus applied as a metallizing spray having a high degree of mechanical adherence to the material of which the igniter extension is formed.

3,928,911
HOLLOW-SHAFT FEED FILAMENT TRIMMER

Charles B. Pittinger, Jr., 79 Maybin Circle, Owings Mills, Md. 21117

Filed Oct. 15, 1974, Ser. No. 514,561
Int. Cl.² B26B 27/00
U.S. Cl. 30—276 9 Claims



1. In a filament trimmer having aframe mounting a rotary drive means, a filament having first and second ends, and means connecting the filament with the rotary drive means, the improvement comprising: the rotary drive means having a hollow output shaft with first and second ends and with an open bellmouth at said first end, the filament disposed in the

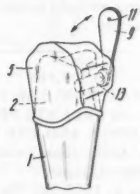
hollow output shaft and having the first end freely protrusive from the bellmouth, and means for securing the second end of the filament and swinging said first end thereof as a filament trimmer on rotation of the rotary drive means.

3,928,912

METHOD FOR MANUFACTURING OF A DETACHABLE JOINT FOR ARTIFICIAL TEETH, AND A STRUCTURAL MEMBER ASSEMBLY THEREFOR

Franz-Peter Just, Bremen, Germany, assignor to Hans Grafelmann, Bremen, Germany

Continuation of Ser. No. 324,183, Jan. 16, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,561
Int. Cl.[2] A61C 13/22
U.S. Cl. 32—5 12 Claims



1. Prefabricated modeling aids for use in preparing an artificial tooth of the kind comprising two crowns releasably secured together and including a first crown cast from a first crown mold prepared from a first crown mold pattern; and a second crown cast from a second crown mold prepared from a second crown mold pattern; said patterns being modeled to conform with each other and the requirements of the jaw whereby the second crown fits over the first crown and is releasably secured thereto; the first crown including a locking strip having a portion removed to define a locking strip recess; the second crown including a rotatably mounted locking part for interengaging with the locking strip in the first crown,

said modeling aids comprising:

a prefabricated locking part for use in producing in said second crown mold pattern a guide means for said locking part, said locking part being operable for use in said artificial tooth and including a prefabricated locking axle and a prefabricated locking blade secured to said prefabricated locking axle, whereby said axle may be rotated to interengage said locking strip.

3,928,913

PALLADIUM ALLOY FOR CERAMIC BONDING

Stephen P. Schaffer, Bloomfield, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Filed Jan. 23, 1975, Ser. No. 543,524
Int. Cl.[2] A61C 13/00; C22C 5/04
U.S. Cl. 32—8 12 Claims

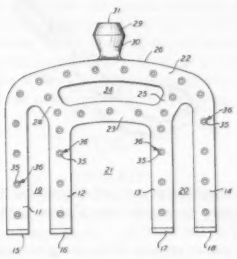
1. A dental casting alloy consisting essentially of about 40–60 percent precious metal component selected from the group consisting of palladium and mixtures of palladium and platinum wherein the platinum is in the amount of up to 12 percent of the alloy but not in excess of 25 percent of the palladium content; 20–59 percent non-precious metal component selected from the group consisting of 20–50 percent cobalt and mixtures of 20–50 percent cobalt and up to 25 percent nickel wherein the nickel content does not exceed the cobalt content; and a modifier selected from group consisting of 1–8 percent indium, 1–3 percent tin, and 1–8 percent of mixtures of tin and indium wherein the tin does not exceed 3percent; said alloy containing as optional additives, 0–5 percent zinc, 0–5 percent iron, 0–5 percent tungsten, 0–2 percent ruthenium, 0–2 percent rhodium and 0–10 percent molybdenum, said alloy having a thermal coefficient of expansion of 14.5–15.2 × 10^{-6} per degree Centigrade up to 600° Centigrade.

3,928,914

ENDOSSEOUS IMPLANT FOR PROSTHETIC TEETH

Isaac M. Kozlovsky, 1 Beach 105 St., Rockaway Park, New York, N.Y. 11694

Filed Aug. 25, 1971, Ser. No. 174,896
Int. Cl.[2] A61C 13/00
U.S. Cl. 32—10 A 10 Claims



1. An endosseous implant for prosthetic teeth, comprising,

a. at least two spaced apart pairs of spaced apart relatively thin, vertically straight legs, each leg having a constant thickness and width from the top to substantially the bottom, the distance between the said pairs of legs being greater than the distance between the respective legs of each pair,

b. an upwardly arcuate, relatively thin, flat upper bridge joining the tops of the outermost legs of each said pair,

c. an upwardly arcuate relatively thin, flat lower bridge vertically spaced apart from the upper bridge joining the tops of the innermost legs of each said pair,

d. a relatively thin, flat arm joining the innermost and outermost leg of each said pair in proximity to their tops, and

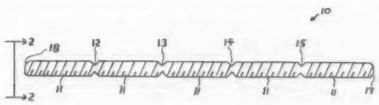
e. a post formed on the uppermost bridge extending vertically upwardly therefrom.

3,928,915

TOOTH ANCHORING MEANS AND METHOD

Irving A. Ellman, 558 Willow Ave., Cedarhurst, N.Y. 11516

Filed Mar. 31, 1972, Ser. No. 240,003
Int. Cl.[2] A61K 5/02
U.S. Cl. 32—15 7 Claims

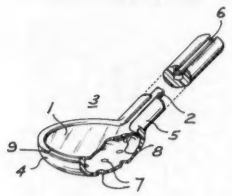


1. A method of anchoring a metal pin to a tooth, comprising forming in the tooth a hole having a width approximately equal to that of the pin, applying a thin coating of a liquid cyanoacrylate cement to an end of the pin, then before the cyanoacrylate cement hardens rapidly inserting the pin end into the hole in order to anchor it therein by means of a bond formed between the cyanoacrylate cement and each of the tooth and the pin, and wherein the pin is supplied in the form of an elongated strip of at least four pins of the same width separated by regions of reduced cross-section, and after the first pin is anchored, the remaining pins still in strip form are broken off, cement again applied to a free pin end, the latter inserted in another tooth hole, and so-on until all the pins on the strip have been anchored in place.

3,928,916
COMBINATION IMPLEMENT FOR DENTAL USE

Tomas Wilhelm Hansson, Ganla Ornasgatan 14, Amal, Sweden

Filed Nov. 14, 1973, Ser. No. 415,620
Claims priority, application Sweden, Nov. 21, 1972, 15092/72
Int. Cl.² A61B 1/24
U.S. Cl. 32—69 4 Claims

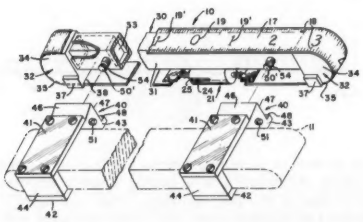


1. A dental instrument comprising in combination:
a dental mirror means having a stem extending from the periphery of the mirror;
a dental extractor means for sucking out saliva accumulating in the mouth of a patient;
said extractor means comprising a shallow bowl having in its wall at least one suction hole for ingress of saliva accumulating in the mouth of a patient and including a handle extending from the bowl, said handle having therethrough a lengthwise bore communicating with the space within the bowl and a lengthwise groove in the outside surface of the handle;
the peripheral outlines of the mirror and the rim of the bowl being so correlated that the mirror is fittable with a pressure fit into the bowl along the rim thereof for releasably attaching the mirror to the bowl thereby covering the open side of the bowl and the groove in the bowl handle being so correlated that the stem is fittable into said groove in the handle simultaneously with pressure fitting of the mirror into the bowl for locking the stem in the groove by sliding a suction hose upon said handle.

3,928,917
POSITION INDEX DEVICE AND DRAFTING APPARATUS COMBINED THEREWITH

James R. Daisey, 103 Compass Drive, Claymont, Del. 19703

Filed Nov. 15, 1974, Ser. No. 524,237
Int. Cl.² B43L 13/00
U.S. Cl. 33—76 R 12 Claims

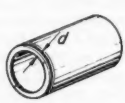


1. A position index device for attachment to drafting apparatus said apparatus having at least one elongated linear guide bar mounted adjacent and parallel to edge of a drafting board, a carriage mounted upon said linear guide bar and constrained to move linearly thereon, and means supported by said carriage for facilitating the drawing of lines, said position index device comprising a flexible position index tape having scale markings thereon, an elongated tape support bar on which said index tape is movably mounted, bracket means for mounting said elongated tape support bar along side of said elongated linear guide bar in spaced parallel relationship thereto, said bracket means and said tape support bar having separable pin and socket connecting means for quickly connecting and disconnecting said tape support bar to and from said bracket means, and a position indicator means positionable on said carriage for indicating the position of said carriage with respect to the scale markings on said tape, said bracket means including at least one mounting block to which said tape support bar is separably connected and clamping means for detachably clamping said mounting block to said elongated linear bar, said mounting block having a flat upstanding face and a flat shelf projecting at a right angle from the base of said face on which said tape support bar rests, said separable connecting means comprising a socket extending into said block from and normal to said face, a pin projecting from said tape support bar and engagable in said socket, and detent means extending into said socket for releasably retaining said pin in said socket.

3,928,918
DEVICE FOR MEASURING THE THICKNESSES OF PARTS HAVING AN ARCUATE PORTION SUCH AS BEARINGS AND THE LIKE

Nobukazu Morisaki, Aichi, Japan, assignor to Daido Metal Company, Ltd., Nagoya, Japan

Filed July 8, 1974, Ser. No. 486,430
Int. Cl.² G01B 5/02
U.S. Cl. 33—172 R 10 Claims



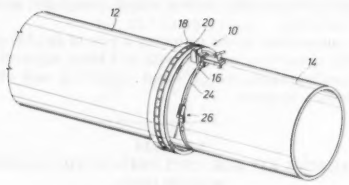
1. A device for measuring the thicknesses of parts having an arcuate portion such as bearings: comprising:
a surface plate provided on a base,
a stopping member disposed on said surface plate, said stopping member having a convexly curved surface substantially perpendicular to said surface plate, said convexly curved surface being adapted to be in contact with the inner surface of said arcuate portion of said parts,
a movable member adapted to be moved relative to said base in the direction parallel to said surface plate, said movable member having a pressing portion adapted to come into contact with the outer surface of said arcuate portion of said parts at two points,
a spring means adapted to impart a spring force to said movable member so that the pressing portion of said movable member presses said arcuate portion of parts to put said arcuate portion between said pressing portion and said stopping member, and
a measuring instrument mounted on said base in adjustably secured relation to said base, said measuring instrument having a detecting rod, the axis of said detecting rod being arranged to be of symmetry for said two points at which said pressing portion comes into contact with the outer surface of said arcuate portion, said detecting rod being adapted to be moved together with said pressing portion away from said stopping member, said arcuate portion being adapted to be placed, substantially perpendicular to said surface plate, between said stopping member, and said pressing portion and said detecting rod when said pressing portion and said detecting rod are spaced apart from said stopping member, said arcuate portion being put between said two points of said pressing portion and said stopping member when said movable member is moved toward the original position thereof by the action of said spring means, the point at which said

stopping member is in contact with the inner surface of said arcuate portion of said parts being on the axis of said detecting rod, and said detecting rod coming into contact with said arcuate portion of said parts.

3,928,919
WELDING TRACK POSITIONING GAUGE

Russell S. Thatcher, 813 Sidnor, Alvin, Tex. 77511

Filed Apr. 25, 1975, Ser. No. 571,777
Int. Cl.² G01B *3/38*
U.S. Cl. 33—180 R **5 Claims**



1. A positioning gauge for fitting into a seam about a workpiece to be welded and precisely locating a welding machine track adjacent thereto, comprising:

a flexible cable with first and second ends, said cable being externally fitted about the workpiece;

a plurality of positioning blocks attached to said cable and radially spaced apart about said cable, each of said blocks including:

a manually adjustable spacing member;

a gauge block opposite said spacing member, said gauge block being a predetermined thickness for spacing said welding machine track a fixed distance from the seam to be welded;

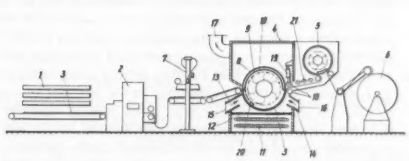
a clamp assembly for engaging said cable and urging said cable into firm contact with said workpiece, said positioning blocks adapted to fit within said seam for rigidly positioning said positioning block with respect to said track; and

a latch mechanism affixed to said first and second ends of said cable, said latch mechanism having an overcenter lock for securing said cable to the workpiece.

3,928,920
SIEVE DRUM DEVICE FOR THE BONDING AND STRENGTHENING OF FELT AND SIMILAR PRODUCTS

Heinz Fleissner, Egelsbach near Frankfurt am Main, Germany, assignor to Vepa Aktiengesellschaft, Switzerland

Filed Feb. 20, 1973, Ser. No. 333,734
Claims priority, application Germany, Feb. 19, 1972, 2207896
Int. Cl.² B29D *7/00*; **F26B** *11/04*
U.S. Cl. 34—115 **9 Claims**

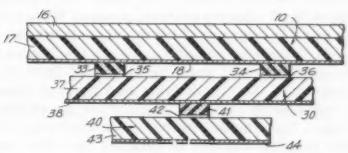


1. In a sieve drum device for the bonding of fleece, needled felt, felt, and similar textile material products by means of thermoplastic binder fibers contained in the textile material which are made to become tacky or to melt by a shock-like heat treatment, wherein the device includes a housing with a first sieve drum means subjected to a suction draft and rotatably mounted in the housing for heat-treatment purposes, followed by a pair of pressure rolls, which rolls are followed by a second sieve drum means subjected to a suction draft for the cooling of the textile material, the improvement which is characterized in that the pair of rolls is disposed directly at an outlet of the first sieve drum housing for said textile material; the rolls can be pressed against each other under a variable pressure, by hydraulically or pneumatically operated means; and the first sieve drum means is associated, across an operating width of said first sieve drum means at a portion covered by the textile material with a first and a second fresh air intake opening means, said first air intake opening means being located at an inlet in said housing for said textile material and said second fresh air intake opening means being located at a zone adjacent to the pair of rolls, said fresh air intake opening means each being adjustable in its opening cross section and each being closable independently of the other.

3,928,921
MULTI-MAGNETIC LAYER TEACHING AID

Norman R. Gurman, Englewood Cliffs, N.J., assignor to Noray Unlimited, Inc., Englewood, N.J.

Continuation of Ser. No. 313,803, Dec. 11, 1972, abandoned.
This application Apr. 8, 1974, Ser. No. 458,860
Int. Cl.² G09B *29/00*
U.S. Cl. 35—7 A **5 Claims**



1. A multi-layer teaching aid for visual presentation of a predetermined scene comprising,

a backing substrate having a portion of said scene on the front surface thereof,

a plurality of substantially flat add-on layers having magnetic means on the rear surface thereof and a pictorial representation on the front surface thereof,

each of said layers being juxtaposable in a superimposed relationship upon said substrate and upon one another,

each of said layers and said pictorial representations thereon forming a different pictorial representation which incorporates the features of the scene of the substrate when said layers are superimposed upon said substrate,

said substrate in conjunction with all of said add-on layers in juxtaposed superimposed relationship with said substrate scene providing the composite pictorial representation comprising said predetermined scene,

said backing substrate comprising at least one contiguous metal stratum capable of acting as a medium for magnetic flux lines, and

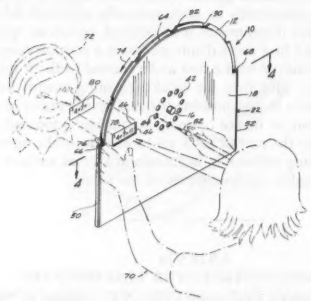
a framework fitted about the periphery of said backing substrate for facilitating the handling thereof and for containing the strata thereof,

whereby a three dimensional view is achieved by applying successive of said layers of magnetic backed material upon the backing substrate which serves as a common medium for the magnetic flux lines of the various layers.

3,928,922
INSTRUCTIONAL AID DEVICE

Peter S. Rosenbaum, 425 Riverside Drive, New York, N.Y. 10025

Filed May 15, 1974, Ser. No. 469,958
Int. Cl.² G09B 3/02
U.S. Cl. 35—9 R 8 Claims

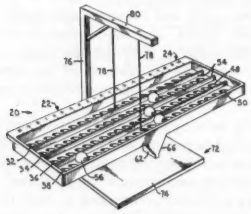


1. An instructional aid device comprising a jacket including a front panel and a rear panel, means for visually displaying a first set of problems with answers at the front panel and simultaneously displaying a second, identical set of problems without answers at said rear panel, the problems of said first set being in registry with identical problems of said second set, a row of holes formed in said front panel with each hole in alignment with an adjacent problem, a row of holes formed in said rear panel in alignment with the respective holes in said front panel, a sheet of frangible material, and means for removably mounting said sheet between said front and rear panels with said sheet underlying said rows of holes, said aligned holes being sized for insertion of a punching tool therethrough from the side of the device displaying the problems with answers, whereby to puncture said sheet adjacent each problem which has been correctly answered, the punctured sheet being removable from said jacket for grading the answers represented by the punctures therein.

3,928,923
MATHEMATICAL BALANCE

James Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Nov. 12, 1973, Ser. No. 415,242
Int. Cl.² G09B 19/02
U.S. Cl. 35—31 R 7 Claims



1. In a mathematical balance:

a beam having a pair of elongated balance arms extending in opposite directions away from a central origin, and further having a pair of spaced longitudinal edges,

each of said arms being provided with an upper surface having a longitudinally extending row of uniformly spaced engagement zones,

said zones subdividing each arm into a linear scale having numerical values associated with the zones that increase with increasing distance from said origin, the distance from said origin to each zone defining a lever arm having a length representing the associated numerical value;

a plurality of tokens of predetermined weight, each configured for engagement with a selected zone; and

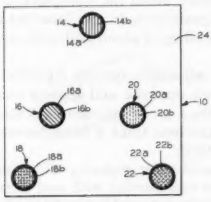
means connected to said beam at said origin and suspending the beam for movement to and from a balanced condition in response to the selective positioning of said tokens at said zones, whereby the beam assumes said balanced condition when the tokens thereon are positioned to equalize the sum of the moments about said origin created by the weights thereof acting through the associated lever arms,

said suspending means including a pair of flexible suspension elements connected with said beam adjacent corresponding edges, and a stand supporting said elements above said beam.

3,928,924
LEARNING KIT FOR CHILDREN WITH LEARNING DISABILITIES

Eileen R. Taska, 14 Wildflower Trail, Greenwich, Conn. 06830

Filed May 3, 1974, Ser. No. 466,544
Int. Cl.² G09B 11/04
U.S. Cl. 35—37 8 Claims



1. A learning kit for use by a learning disabilities teacher to teach children having learning disabilities to recognize and to correctly form by writing alphabetical and numerical characters comprising:

a. a multiplicity of individual cards constituting a set thereof, each one of said set of individual cards consisting of a planar member having at least one surface thereof suitable for writing thereon, said one surface of each one of said set of individual cards having the image of a set of individual, differently colored symbols comprising a circle consisting of a border defining the circumference of the circle and a colored center, each one of said set of individual, differently colored symbols being located on said one surface of the corresponding one of said set of individual cards in spaced relation relative to each other to form thereon the outline of a preselected character selected from the alphabetical and numerical characters, said set of individual, differently colored symbols on said one surface of the corresponding one of said set of individual cards consisting of the minimum number thereof to establish the outline of said preselected character; and

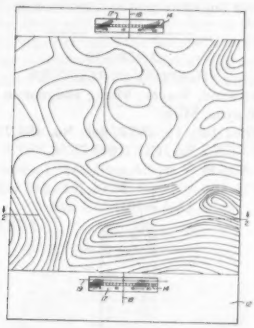
b. a multiplicity of different reading scripts comprising a set thereof corresponding in number to the number of cards in said set of individual cards, each one of said set of different reading scripts being employable solely with a particular one of said set of individual cards, each one of said set of different reading scripts comprising textual material consisting of a story, each of said stories including a multiplicity of instructions for interconnecting said set of individual, differently colored symbols to complete the formation of the character on the corresponding one of said set of individual cards by referring to each one of said set of individual, differently colored symbols by the

color thereof in accord with a predetermined sequence corresponding to the same sequence of manipulative movements employed when said character on the corresponding one of said set of individual cards is manually written.

3,928,925
METHOD AND MEANS FOR PRODUCING STEREOSCOPIC CONTOUR MAPS

Sylvester Parker Gay, Jr., 1941 South 13th East, Salt Lake City, Utah 84108

Continuation of Ser. No. 841,790, July 15, 1969, abandoned. This application Sept. 13, 1971, Ser. No. 179,846
Int. Cl.² G09B *25/06*
U.S. Cl. 35—40 **5 Claims**



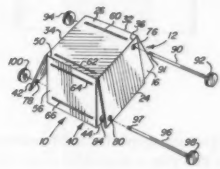
1. A method of producing a single stereoscopic pair of contour maps, comprising placing in face-to-face relationship a total of two copy sheets and an original contour map sheet with impression transfer means interposed between said sheets; tracing a selected contour line from said map sheet onto said copy sheets, so as to produce two identical and non-distorted tracings; shifting two of said sheets relative to the third and relative to each other by respective distances related to the contour value of the next contour line to be traced and tracing said next contour line on said map sheet, so as to produce a pair of identical and non-distored, stereoscopically offset tracings on the respective copy sheets; and repeating the said shifting and tracing for additional contour lines of said map sheet wherein the copy and map sheets are shifted by respective distances that make equal offsets for the paired tracings on the two copy sheets relative to the corresponding contour line traced on the contour map sheet, each copy sheet and the contour map sheet being provided with reference markings at mutually corresponding locations, establishing both vertical and horizontal axes; a scale of contour values being provided at a location visible to a person tracing the contour lines of the contour map and correlated with the axis from which the sheets are shifted; and the sheets being shifted with reference to said markings and said scale of contour values.

3,928,926
SHOW AND TELL APPARATUS

Ronald S. Carriveau, 514 W. Turney, Phoenix, Ariz. 85013

Filed Jan. 29, 1975, Ser. No. 545,176
Int. Cl.² G09B *1/24*
U.S. Cl. 35—76 **3 Claims**

1. Apparatus for writing and displaying on adjacent sides, comprising, in combination:
- a first and second panel connected to each other and disposed substantially perpendicular to each other;
- a pair of side panels generally parallel to each other and each disposed substantially perpendicular to the first and second panels and connected thereto;
- a back panel connected to the first panel and the side panels and disposed generally parallel to the second panel, said first and second panels, back panel, and side panels defining a hollow container;
- a first slot and a second slot generally parallel to each other in the first panel;
- a first slot and a second slot generally parallel to each other in the second panel and disposed generally parallel to the slots in the first panel;
- a pair of first holes, one in each of the side panels, aligned with each other and disposed adjacent the first slot in the first panel;

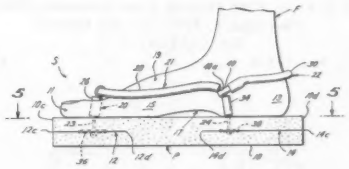


- a pair of second holes, one in each of the side panels, aligned with each other and disposed adjacent the second slot in the second panel;
- a first rod extending through the first holes in the side panels;
- a second rod extending through the second holes in the side panels; and
- a medium for writing and drawing wound about the first rod within the container and extending outwardly through the first slot on the first panel, inwardly through the second slot on the first panel, outwardly through the first slot on the second panel, inwardly through the second slot on the second panel, and wound about the second rod.

3,928,927
SANDALS AND METHOD FOR MAKING SAME

Dwight Collin Brown, and Kevin Bruce Brown, both of 4118 Mischire, Houston, Tex. 77025

Filed Nov. 25, 1974, Ser. No. 526,466
Int. Cl.² A43B *3/12*; A43D *9/00*
U.S. Cl. 36—11.5 **17 Claims**

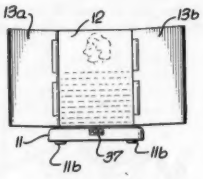


1. A sandal adapted to be worn on the foot comprising:
- a platform conforming substantially to the shape of the sole of the foot and including a toe end and a heel end, said platform further having an upper surface and a lower surface, said platform having a first slit and a second slit, said first slit formed at said toe end of said platform and said second slit formed at said heel end of said platform; strap means mounted with said platform for securing said platform to the foot;
- securing means mounted in said first slit and said second slit in attachment with said strap means for securing said strap means with said platform; and
- means for closing said first and second slit together after the mounting of said securing means.

3,928,928
AUDIO VISUAL MEMORIAL

Pierre M. Kalust, 5902 Irvine St., North Hollywood, Calif. 91601

Filed Apr. 1, 1974, Ser. No. 456,860
Int. Cl.² G09F 27/00
U.S. Cl. 40—28.1 4 Claims



1. In an audio visual memorial, the combination comprising
a. a support for carrying a memorial object in the form of an memorial book and a cover carried on the support for movement between a first position in which the memorial object is covered and a second position in which the memorial object is exposed to view,
b. first means including a recording operable to produce an audio frequency memorial accompaniment to exposure of the memorial object, and a first drive to drive the recording, and
c. second means coupled with the cover for effecting operation of said recording in conjunction with said exposure of the object,
d. the support including a plate inclined upwardly and rearwardly at the rear side of the book which is supported flatly against the plate, the support also including an enclosure enclosing said first and second means at a predetermined level, the support defining a locus for said book to extend higher than said predetermined level,
e. said second means including a second drive coupled with the cover to effect swinging movement of the cover to said second position, and there being a motor directly coupled to said first and second drives respectively and means to actuate the motor.

3,928,929
OUTDOOR ADVERTISING SIGN

Robert D. Forte, 8288 Firwood Lane, Greendale, Wis. 53129

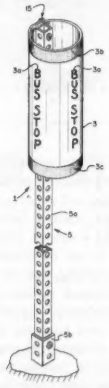
Filed Sept. 5, 1974, Ser. No. 503,347
Int. Cl.² G09F 7/18
U.S. Cl. 40—125 K 4 Claims

1. An outdoor advertising sign comprising:
a single tubular support pole,
a frame for displaying an advertising sign, said frame comprises a number of upright sections, a plurality of cross braces and a number of support plates secured to the upright sections and cross braces at their points of intersection,
and means on said pole for removably supporting said frame in an upright position on said pole, said support means including a pair of elongate angle iron members and a number of cross arms secured to said members, said members being spaced apart a distance equal to the diameter of said tubular pole whereby said frame is supported on said pole with said elongate members located in a parallel relation and adjacent to each side of said pole, said frame includes a panel on one surface on which a sign can be displayed and a number of clips on the other surface for engaging said support means.

3,928,930
SIGNPOST STRUCTURE

Warren R. Attwood, Wayne, Mich., assignor to Unistrut Corporation, Wayne, Mich.

Filed July 15, 1974, Ser. No. 488,714
Int. Cl.² G09F 7/18
U.S. Cl. 40—145 R 12 Claims



1. A signpost structure, comprising:
a hollow cylindrical sign formed an initially rectangular, flat, flexible sign blank, said sign blank having first and second side edges and first, second, fourth and forth openings provided therein in first, second, third and fourth corner regions thereof, respectively, the first and second openings being adjacent to the first side edge of the sign blank and the third and fourth openings being adjacent to the second side edge of the sign blank, said sign blank further having an outer surface having a plurality of identical items of information thereon;
edge-placement means placing the first and second side edges of the sign blank adjacent to each other thereby to from the intially flat, rectangular sign blank into the hollow cylindrical sign, said edge-placement means including an S-shaped member having first and second diagonally opposed edge-receiving portions arranged to receive the first and second side edges, respectively, of the sign blank and a flat portion between the first and second edge-receiving portions and having first and second spaced openings therein, the openings in the sign blank and in the flat portion of the S-shaped member being arranged so that the first second openings in the sign blank are coaxially aligned with the first opening in

the flat portion of the S-shaped member and the third and fourth openings in the sign blank are coaxially aligned with the second opening in the flat portion of the S-shaped member when the first and second side edges of the sign blank are received by the respective first and second edge-receiving portions of the S-shaped member, the plurality of items of information at the outer surface of the sign blank being arranged so that at least one item of information is always presented to a viewer when the side edges of the sign blank have been placed adjacent to each other in forming the cylindrical sign:

an elongated support member having a cross-sectional area less than the cross-sectional area of the cylindrical sign; and

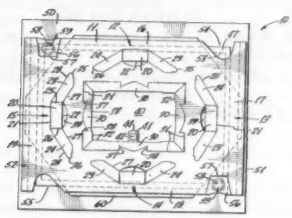
mounting means including means employing the first and second openings in the sign blank and the first opening in the flat portion of the S-shaped member and means employing the third and fourth openings in the sign blank and the second opening in the flat portion of the S-shaped member for mounting the cylindrical sign and the associated S-shaped member to the elongated support member.

3,928,931

STAND-OFF TYPE WALL-MOUNTED PICTURE FRAME

John W. Slemmons, 19142 Glen Albyn, Orange, Calif. 92669

Filed Feb. 11, 1974, Ser. No. 441,655
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152.1 **9 Claims**



1. A picture mount comprising:

a generally rectangular, planar backing member including four integral, identical, fold-out legs and four integral, identical, fold-out locking tabs positioned parallel to and spaced from respective legs, each of said legs including a pair of integral, opposed, side tabs, foldable relative to said legs towards respective locking tabs, said legs and said locking tabs folding outwardly along lines parallel to and adjacent the four sides of said backing member, said side tabs being foldable towards the center of said backing member, said locking tabs engaging and holding the ends of respective side tabs in locked positions with substantial portions of the outer edges of said legs and said locking tabs coplanar.

3,928,932

ANIMATED FIGURE TOY

Donald John Maurer, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 11, 1974, Ser. No. 531,837
Int. Cl.² A63H *3/28*
U.S. Cl. 46—118 **16 Claims**

1. A toy figure comprising:

A. a lower torso having at least two legs and having a vertically-disposed open channel between said legs;

B. an upper torso rotatably coupled to said lower torso;

C. a base structure supporting said lower torso in a relatively stationary position, said base structure including a journal communicating with said vertically-disposed open channel; and

D. actuating means for rotating said upper torso, comprising:

1. a post rotatably mounted in said journal and said vertically-disposed open channel, said post including an upper end coupled to said upper torso for oscillating said upper torso when said post is oscillated; and

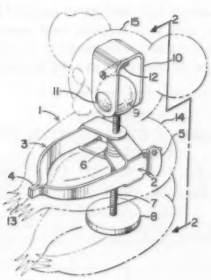
2. an actuating lever on said post, said actuating lever extending to the exterior of said base structure, whereby said actuating lever may be swung back-and-forth to oscillate said upper torso.

3,928,933

HOLDING TOY

Takeji Iwamoto, 1441 Kapiolani Blvd., Suite 1014, Honolulu, Hawaii 96814

Filed Nov. 11, 1974, Ser. No. 522,747
Claims priority, application Japan, Dec. 21, 1973, 48-4407
Int. Cl.² A63H *3/46*
U.S. Cl. 46—119 **7 Claims**

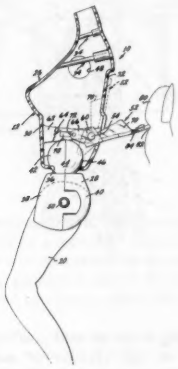


1. A toy comprising a covering and a framework; the framework includes a clamping device, a shaft, and an inner head; the clamping device is connected to the middle portion of the shaft; the clamping device has two clamping parts, two handle parts, and a spring; the spring is coiled around the shaft and its ends are pressed against the inside surfaces of the handle parts of the clamping device; the inner head is mounted on one end portion of the shaft; the covering is fitted over the framework with the clamping parts inserted in the hands, the handle parts inserted in the shoulders, and the inner head inserted in the head.

3,928,934
CONTROLLER FOR A FIGURE TOY

J. Stephen Lewis, Pacific Palisades, and Jurgis Sapkus, Manhattan Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 18, 1974, Ser. No. 524,726
Int. Cl.[2] A63H *11/00*
U.S. Cl. 46—119 12 Claims



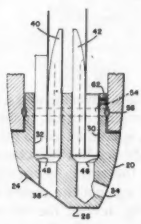
1. In a figure toy construction including a torso having an upper torso member and a lower torso member and means connecting said torso members together so that said torso members may rotate with respect to each other, the improvement which comprises:

a torso-control means movably mounted on said torso, said torso-control means including means for imparting a frictional drag to said connecting means when said torso-control means is moved to a first position and for releasing said frictional drag when said torso-control means is moved to a second position, whereby said torso-control means will hold said torso members in predetermined rotated positions when said torso-control means is in said first position and will release said torso members for unobstructed rotation with respect to each other when said torso-control means is in said second position.

3,928,935
CHANGEABLE GAME CALLER WITH TWO DISTINCT SOUND SYSTEMS

Glenn H. Beadles, Jr., P. O. Box 402, Lake Charles, La. 70601

Filed June 24, 1974, Ser. No. 482,629
Int. Cl.[2] A63H *5/00*
U.S. Cl. 46—180 1 Claim

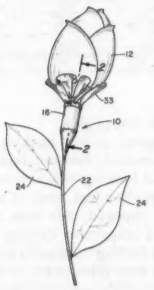


1. A game calling device comprising a hollow-barrel-configured member having an opening at one end thereof and a mouthpiece at the other end thereof, an air chamber disposed within the hollow-barrel-configured member extending from said mouthpiece to and contiguous with said opening, a key-contoured member having at one end a mating surface interfitting with said opening of the hollow-barrel-configured member and having a truncated portion forming at least two surfaces at the other end, a pair of nonaxial essentially cylindrically shaped openings at said mating surface and communicating with respective passages which extend to and terminate each in a respective one of said surfaces of the truncated portion, a vibrating reed element mounted in each of the cylindrically shaped openings at the mating surface, sealing and securing means comprising an elastomeric O-ring fitted within an annular groove in the mating surface for forming an air-tight seal between the hollow-barrel-configured member and the key-contoured member and for securing them together, the vibrating reed elements comprising portions of two distinct sound systems for calling different species of game fowls, the two surfaces of the truncated portion of said key-contoured member being selected to allow an operator's hand to conform to the contour of the device so that alternatively the operator's fingers may completely or partially close off one or the other of the passages, at least one of the vibrating reed elements being adjustably positioned longitudinally within its cylindrical shaped opening for modifying sound, and a set-screw being disposed in the wall of the passageway of the cylindrical shaped opening to secure the vibrating reed element in place.

3,928,936
FLOWER HOLDER

Dennis J. Wollen, 1116 E. Lexington Ave., Apt. C, Glendale, Calif. 91206

Filed Sept. 9, 1974, Ser. No. 504,329
Int. Cl.[2] A01G *5/00*
U.S. Cl. 47—41 SS 3 Claims



1. A flower holder comprising:

a housing having an internal chamber therein, an opening in said housing providing access into said chamber, said chamber having a closed bottom and a side wall and an open top;

absorbent means contained within said chamber at said closed bottom, said absorbent means adapted to contain a liquid; and

retaining means attached to the wall of said chamber and located between said opening and said closed bottom, said retaining means comprising a plurality of protuberances extending inwardly toward the center of said chamber, each of said protuberances being sharp pointed, there being at least two longitudinally spaced apart rows of said protuberances with there being a plurality of protuberances for each said row, said protuberances in each said row being evenly spaced apart, the area of said protuberances for a single row being approximately one-half the cross-sectional area of said chamber, said protuberances being slightly deflectible, whereby as the stem of

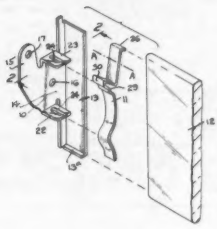
a flower is inserted into said chamber said protuberances deflect and bind into the flower stem thereby providing holding force for the flower stem with the stem contacting said absorbent means.

3,928,937

JALOUSIE LOUVER BRACKET

Nathan Dovman, 6713 Akron St., Philadelphia, Pa. 19148

Filed Oct. 21, 1974, Ser. No. 516,151
Int. Cl.² E06B *7/08*
U.S. Cl. 49—403 **10 Claims**



1. A bracket assembly for quick-detachably engaging and supporting one end of a louver in a jalousie frame comprising

a. a swingably mounted main bracket member having

1. a mounting flange disposed in a plane extending orthogonally with respect to the plane of the louver for limiting endwise movement thereof,
2. an elongated base flange integral with and right angularly related to said mounting flange adapted to overlie and engage the outside surface of the louver when the same is in substantial engagement with said mounting flange,
3. a louver abutting stop at the bottom end of said base flange, and
4. a pair of vertically spaced parallel lugs extending from said mounting flange crosswise of and at right angles to said base flange with corresponding edges thereof spaced from said base flange a distance greater than the thickness of the jalousie louver, said lugs being respectively provided with vertically registering openings each in the form of an open-ended slot for permitting edgewise insertion thereinto of a flat leaf spring member, and

b. an elongated spring metal member extending through said openings in said lugs in overlying relation to said base flange of said main bracket member, said spring member having spaced portions thereof resiliently biased to engage the inside surface of the jalousie louver when its aforesaid end is disposed in position between said base flange and said spring member, said spring member including means which coact with at least one of said slotted lugs to preclude shifting movement of said spring member longitudinally with respect to said bracket member when said spring member is interfitted in said lug openings.

3,928,938

METHOD FOR EVACUATING PACKAGES

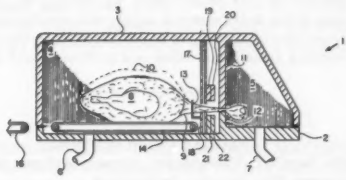
William E. Burrell, Duncan, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 375,300, June 29, 1973. This application June 19, 1974, Ser. No. 480,907The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.
Int. Cl.² B65B *31/02*
U.S. Cl. 53—22 B **3 Claims**

3. A process of evacuating and closing flexible, impervious receptacles such as pouches, bags and the like which have at least one opening and contain at least one product comprising the steps of:

a. confining the product containing portion of said receptacle within a first region;

b. confining a portion of the receptacle which contains said opening in a second region so that the interior of said receptacle is in communication with said second region through said opening;



c. reducing the pressure within said first region thereby causing at least a part of said receptacle to move outwadly away from contact with said product; and, subsequently,

d. reducing the pressure within said second region to evacuate the interior of said receptacle so that the receptacle again contacts the product; and,

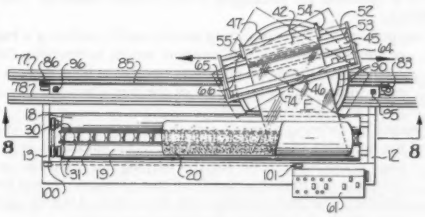
e. closing said opening thereby making an evacuated, sealed, package.

3,928,939

METHOD OF WRAPPING ELONGATE CYLINDRICAL OBJECTS

John M. Edwards, Charlotte, N.C., and James D. Wright, Berkley Heights, N.J., assignors to John Edwards & Associates, Inc., Charlotte, N.C.

Division of Ser. No. 360,156, May 14, 1973, Pat. No. 3,863,425. This application Oct. 29, 1974, Ser. No. 518,995
Int. Cl.² B65B *11/04*
U.S. Cl. 53—32 **7 Claims**



1. A method of covering a cylindrical object with elongate sheet material having a width less than the length of said object, said method comprising steps of

a. rotating said object,

b. withdrawing the elongate sheet material from a rotatable supply roll and wrapping it around one end portion of said object while maintaining the rotational axis of the sheet material supply roll parallel to the rotational axis of said

object to provide at least one convolute winding around said one end portion of said object,

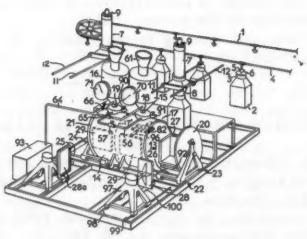
c. continuing to withdraw the elongate sheet material from the supply roll and wrapping it around the medial portion of said object while moving the sheet material supply roll parallel to said object and with the rotational axis of the supply roll in angular relationship to the rotational axis of said object to provide spiral windings around said medial portion of said object, and

d. continuing to withdraw the elongate sheet material from the supply roll and wrapping it around the other end portion of said object while maintaining the rotational axis of the sheet material supply roll parallel to the rotational axis of said object to provide at least one convolute winding around said other end portion of said object.

3,928,940
PACKAGING MACHINE

Gaston Fagniart, Valenciennes, France, assignor to Societe Anonyme dite: Boracier, Switzerland

Filed Feb. 27, 1974, Ser. No. 446,205
Claims priority, application France, Mar. 2, 1973, 73.07831
Int. Cl.[2] B65B *31/02*
U.S. Cl. 53—112 B **18 Claims**



1. A machine for packaging finely divided material, comprising;

support means for supporting and laterally confining a bag of flexible material, said support means comprising flat rigid walls defining an enclosure open at at least its upper part, to prevent deformation of the bag when the bag is filled with divided material;

means for defining a first chamber, for sealing it tightly and for receiving therein the material to be packaged in the bag; a discharge pipe for discharging the material received in the first chamber from that chamber; means for defining a second chamber and for sealing it tightly, and into which chamber the discharge pipe opens;

means for maintaining a controlled gaseous atmosphere selectively in said first chamber for treatment of the material received therein, and in both chambers for controlled filling of the bag;

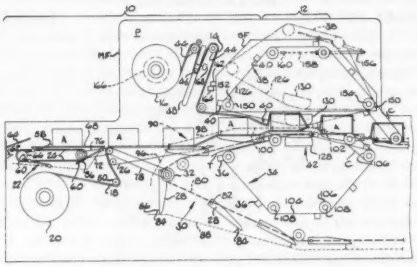
closure means for supporting the support means, for enabling introduction of the support means and of the bag thereon into the second chamber, and for positioning a neck of the bag under the discharge pipe to enable filling of the bag, in the controlled gaseous atmosphere, with finely divided material previously treated by exposure to such atmosphere in the first chamber; and

means in the second chamber for sealing the neck of the bag pursuant to the filling of the bag.

3,928,941
MACHINE FOR WRAPPING ARTICLES

Alec Singer, 14 Mountain Road, Claremont, Cape Town, Cape Province, South Africa

Filed Jan. 25, 1974, Ser. No. 436,585
Claims priority, application South Africa, Feb. 12, 1973, 73/0978; Aug. 13, 1973, 73/5521
Int. Cl.[2] B65B *11/18*
U.S. Cl. 53—182 **11 Claims**



1. A machine for wrapping articles comprising:

a. a plurality of supports for receiving articles and transporting the articles in spaced-apart relationship along an article feed path having a first linear portion intersecting with and obliquely disposed to a succeeding adjacent second linear portion, whereby a support transporting an article along the first linear portion of said article feed path will be in step-wise relationship with a a support transporting an article along said second linear portion;

b. a plurality of wrapping members for forming wrapping material into sleeves around said articles;

c. means for guiding said wrapping members along a path which lies substantially in or parallel to the plane defined by said first and second linear portions and which converges with said article feed path before said first linear portion intersects with said second linear portion; and

d. driving means for moving said plurality of supports and said plurality of wrapping members along their respective paths continuously and in synchronism, the oblique disposition of said first and second linear portions being such in relation to the wrapping member guiding means that said wrapping members enter the spaces between adjacent articles while the trailing one of said adjacent articles moves along said first linear portion and while the leading one of said adjacent articles moves along said second linear portion, whereby said wrapping members avoid obstruction from the leading edge of said trailing article.

3,928,942
MEANS TO GUIDE A LAYER OF OBJECTS INTO A BOX

Paul F. Paddock, Riverside, and Jerry W. Cramer, Upland, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Apr. 19, 1974, Ser. No. 462,215
Int. Cl.[2] B65B *39/02, 39/12, 35/38*
U.S. Cl. 53—247 **23 Claims**

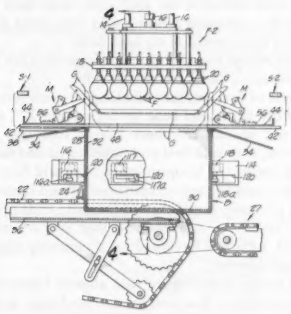
1. In an apparatus for automatically packing layers of objects into successive boxes at a packing station, wherein a pickup head picks up a layer of the objects and descends briefly into a box to deposit the layer therein,

the improvement comprising:

a guide chute extending upward from the box and defining a zone of approach to the box, said chute being shaped and dimensioned to surround a layer of objects on a pickup head as the layer descends to the box and to confine the layer of objects to the inside dimensions of the box,

said chute being made of separate parts movably mounted on said apparatus to permit the chute to be disassembled by moving the separate parts away from their assembled positions to positions spaced upwardly of said box and to be reassembled by restoring the parts to their assembled positions;

means to disassemble the chute by moving the upper edges of the separable parts in different directions outwardly



from the path of descent of each layer of objects before the layer descends to the level of the upper ends of the parts of the chute thereby to keep the descending layer from encountering the upper ends of the parts of the chute; and

means to reassemble the chute responsive to downward movement of a descending layer of objects on a pickup head after said objects pass the level of the upper end of the chute.

3,928,943

DEVICE FOR THE FEED OF GRINDING TOOLS TO GRINDING MACHINES

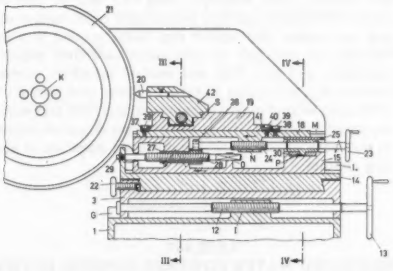
Walter Wirz, Dietlikon, Switzerland, assignor to Reishauer AG., Switzerland

Filed Sept. 11, 1974, Ser. No. 505,059

Claims priority, application Switzerland, Sept. 17, 1973, 13303/73

Int. Cl.² B24B *49/18*

U.S. Cl. 51—5 D **9 Claims**



1. A feed device for grinding machines having a support with which a grinding wheel is operatively associated and on which it is supported and in which the support and rotatable work-piece are slidable relative to each other comprising:

a slidable adjusting carriage;

a trimming device mounted on said carriage, said trimming device being adapted to have a trimming tool disposed therein;

means for shifting said adjusting carriage transversely to the grinding wheel axis, said shifting means including a threaded spindle slidably disposed in the support and in threaded engagement with said adjusting carriage;

control means interconnecting the support and said adjusting carriage to provide an additional shifting of the adjusting carriage;

said control means including a slide member which is carried by the support and which is shifted during the adjustment operation transversely to the grinding carriage guide, said slide member having a groove or slot formed therein; and

a slide pin which is guided in said groove or slot to thereby impart additional shifting to the threaded spindle.

3,928,944

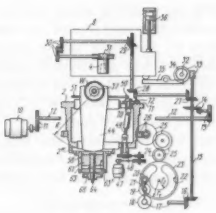
STRAIGHT BEVEL GEAR GRINDING MACHINE

Vasily Nikolaevich Kedrinsky, ulitsa Vavilova 93, kv. 23, and Ivan Dmitrievich Zakharov, Kavkazsky bulvar, 41, korpus 1, kv. 5, both of Moscow, U.S.S.R.

Filed Mar. 8, 1974, Ser. No. 449,467

Int. Cl.² B23F *5/10*

U.S. Cl. 51—33 W **6 Claims**

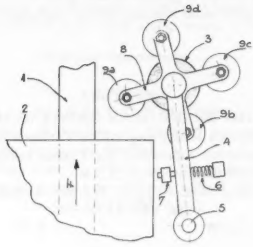


1. A straight bevel gear grinding machine comprising a rotatable cradle carrying a tool means mounted for oscillating motion inside said cradle between guide means secured in a rectangular hole provided in the cradle body; a base; a wheel rotation drive; a spindle carrying a disk tool and receiving rotation from said drive; another spindle carrying the gear being machined and mounted on said base and being kinematically associated with said cradle; said tool means comprising a carriage carrying said spindle with said disk tool inside said cradle and capable of oscillating motion; drive means mechanically connected to said carriage to impart to the latter oscillating motion lengthwise the tooth space of the gear being machined; said guide means comprising guide members mounted in said rectangular hole of said cradle for accommodating said carriage inside said cradle, said guide members being L-shaped in cross-section, one of the surfaces of said guide members being fitted to the cradle rear and front faces, while the other surfaces thereof are fitted to the corresponding surfaces of the cradle holes so that the top surfaces of the holes and the surfaces of the guide members fitted thereto have a slope towards the cradle interior to enable adjustment of the clearance between the carriage and the guide members.

3,928,945
APPARATUS FOR MACHINING THE ANGLES OF A PLATE

Julien Albert Devillers, Livry Gargan, France, assignor to Intercontinental Trading Company - Intraco, Puteaux, France

Filed Dec. 24, 1974, Ser. No. 536,191
Claims priority, application France, Dec. 26, 1973, 73.46203; June 6, 1974, 74.19629
Int. Cl.² B24B *9/00*
U.S. Cl. 51—80 A **11 Claims**

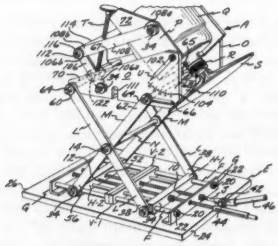


1. An apparatus for machining an angle of a moving plate comprising a rotary grinding wheel; a ring of rollers surrounding the grinding wheel and mounted for free rotation thereon; means for displacing the grinding wheel and the ring together between a first position in which one of the rollers is situated in the path followed by the plate, and a second position in which two successive rollers are simultaneously in contact with one lateral edge of the plate, via a third intermediate position in which the grinding wheel is in contact with the angle of the plate to be machined and in which two successive rollers are in contact with the front or rear edge and with said side edge, respectively of the plate; and means for biassing the grinding wheel and ring into the said first position.

3,928,946
THREE AXIS ADJUSTABLE DISC SANDER

Virgil J. Wynn, 821 N. Louise, Santa Ana, Calif. 92703

Filed May 14, 1975, Ser. No. 577,548
Int. Cl.² B24B *7/00*, *9/00*; B24D *17/00*; B66F *3/00*
U.S. Cl. 51—109 **9 Claims**



1. In combination with a horizontal support of a desired elevation on which a workpiece may rest to slide in a first direction thereon when in contact with an elongate guide that occupies a fixed position relative to said support, a device that permits a power-driven sander disc to be adjusted laterally, vertically and angularly relative to said guide to contact said workpiece as the latter is moved in said first direction, said device including:

a. a horizontal base disposed at a fixed position adjacent said support;
b. a pair of spaced parallel rails disposed above said base and normal relative to said guide;
c. first and second spaced crosspieces secured to said base and supporting said pair of rails therebetween;
d. first and second parallel cross members slidably supported on said rails;
e. first means that are manually operated for moving said first cross member on said rails, with said first means when not operated holding said first cross member at a desired fixed position on said rails;
f. second means that are manually operated for moving said second cross member on said rails;
g. two sets of first and second elongate members that extend upwardly from said base to define an "X", each of said first and second members having first and second end portions, with said first end portions of said first members being connected to opposite ends of said first cross member, and said second end portions of said second members being pivotally connected to opposite ends of said second cross member, with each of said sets of said first and second members having aligned centrally disposed bores formed therein;
h. third means that engage said aligned bores for pivotally connecting said first and second members in each of said sets;
i. a pair of spaced parallel side walls that have first and second end portions, with said first end portion having elongate horizontal slots formed therein;
j. fourth means slidable in said slots and pivotally connected to said first end portions of said second members;
k. fifth means that pivotally connect said second end portions of said side walls;
l. at least one horizontal plate that connects the longitudinal edges of said side walls most adjacent said base;
m. a cradle pivotally supported between said side walls and above said plate;
n. an electric motor supported in a fixed position in said cradle, said motor including a stub drive shaft;
o. sixth means for removably securing said sander disc to said drive shaft;
p. seventh means that are manually operated for pivoting said crable, motor and sander disc to a desired angular relationship relative to said horizontal plate;
q. eighth means for visually indicating the vertical angle of said sander disc; and
r. first and second stops that extend towards one another from said first and second cross members, with said first and second cross members, said two sets of first and second members, said side pieces, said plate, said cradle, and said motor and sander disc being moved as a unit laterally on said pair of rails when said first means is operated, and said first and second members pivoting relative to one another to raise or lower said sander disc when said second means is operated, and with said motor-supporting cradle being at a maximum elevation relative to said base when said first and second stops are in abutting contact.

3,928,947
PRESSURIZED WATER POWERED SANDING DEVICE

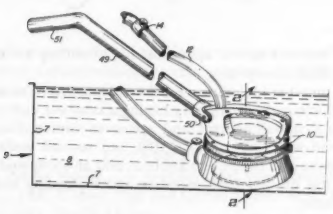
Dennis A. Millett, 4601 S. Rita Lane, Tempe, Ariz. 85282

Filed Feb. 8, 1974, Ser. No. 440,674
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 T **15 Claims**

1. In apparatus for cleaning swimming pool surfaces while said surfaces are under water,

a. a body presenting a peripheral surface and a bottom surface;
b. a water powered motor carried by said body and having a water inlet and a water outlet;

c. a pump having a low pressure side and a high pressure side provided by said pump;
d. a flexible conduit having one end connected to said pump at the high pressure side thereof, with the other end of said conduit being connected to the water inlet of said motor;
e. a skirt mounted on said body, depending below said bottom surface thereof and presenting an edge which is spaced from a swimming pool surface a slight distance to provide a narrow gap between said edge and said pool surface;
f. a drive shaft having one end operatively connected to said motor by which it is driven and extending beyond said bottom surface of the body substantially to the plane of said skirt edge;



g. a cleaning element;
h. mechanism drivably connecting said cleaning element to said drive shaft at the end of the latter remote from said motor;
i. a water outlet in said skirt;
j. a source of low pressure;
k. a flexible conduit having one end connected to said source of low pressure, with its other end being connected to the water outlet of said skirt, and
l. a handle connected to said body,

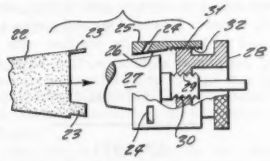
whereby a low pressure is created in the water within said skirt as compared to the pressure of ambient water as water is supplied therefrom through said outlet, and ambient water is drawn through said gap and entrains particles removed from the pool surface being cleaned by said cleaning element.

3,928,948

SANDING CONE

Anthony Denunzio, and George Spector both of 3615 Woolworth Bldg. 233 Broadway, New York, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,268
Int. Cl.² B24D *17/00*
U.S. Cl. 51—379 **2 Claims**



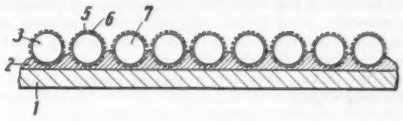
1. In a sanding cone, the combination of a conically tapered mandrel and a similarly shaped sandpaper sock snugly and replaceably fitted thereon said mandrel having an axial shank projecting from one end of the mandrel adapted to be mounted in the chuck of a portable power drill including a collar adjustably mounted axially on the mandrel whereby the shank projects axially through said collar, further including a sleeve mounted axially adjustable on the collar encompassing and fitting closely about said one end of the mandrel and sock for retaining the sock on the mandrel in an adjustable manner, wherein said collar includes means for securing and engaging said sock on said mandrel.

3,928,949

HOLLOW BODY GRINDING MATERIALS

Eckhard Wagner, Elmshorn, Germany, assignor to Norddeutsche Schleifmittel-Industrie Christiansen & Co., Hamburg, Germany

Filed May 1, 1974, Ser. No. 465,802
Claims priority, application Germany, Sept. 26, 1973, 2348338; Oct. 5, 1973, 2350139
Int. Cl.² B24D *3/34*
U.S. Cl. 51—401 **20 Claims**



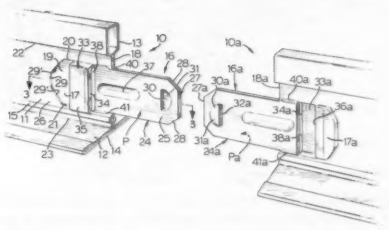
1. A grinding material comprising a multiplicity of hollow bodies whose walls contain abrasive grains in an amount of more than 50% of the wall surface and a bonding means selected from the group consisting of a synthetic resin, a ceramic binder and a metallic binder and are arranged to be stable in resistance to grinding forces, the mean diameter of said hollow bodies are measured parallel to a grinding surface lies between 0.1 and 8 mm and is not more than 50 times the mean grain diameter and the abrasive grains are contained substantially within the walls of the hollow bodies.

3,928,950

STRUCTURAL MEMBER WITH END CONNECTOR

John O. Beynon, Waterloo, Canada, assignor to Preston Metal and Roofing Products Limited, Cambridge, Canada

Filed May 17, 1974, Ser. No. 470,721
Int. Cl.² E04C *3/04*
U.S. Cl. 52—726 **10 Claims**



1. A structural member having a planar web portion provided at least at one end with an integral connector means to enable the member to be connected in end to end relation with a corresponding member having a corresponding connector means, said connector means comprising a tongue receiving socket portion extending longitudinally inwardly from the end of the member and formed by displacing a portion of the web out of its plane to provide a socket bottom offset to one side of the plane of the web, a continuous resilient retainer strap connected at its ends to said web struck from said socket bottom transversely of said socket intermediate the ends thereof and offset to the other side of the plane of the web to transversely bridge said socket in spaced relation to the bottom thereof, the portion of the socket bottom from which said strap is struck defining a slot in the socket bottom extending transversely thereacross, and a resilient cantilever tongue portion of a configuration to be received in a socket portion corresponding to the aforesaid socket portion, said tongue extending longitudinally outwardly from the end of the member as an extension of and coplanar with said socket bottom,

said tongue being formed to present intermediate the ends thereof a locking barb projecting therefrom on the side thereof away from the plane of the web, said barb having a strap engaging locking shoulder facing away from the end of the tongue, said strap having its leading edge facing towards said tongue portion flared outwardly away from the socket bottom to present a flared entrance to facilitate insertion of the tongue of a corresponding member beneath said strap, and the bottom socket portion forming the edge of said slot nearest the inner end of the socket being flared out away from the plane of the socket bottom and the plane of the web of the member and opposite to the flare of said strap leading edge to provide a cam and guide surface to cam and guide the leading portion of the tongue of a corresponding member being forced under said strap into the inner end of the socket, the arrangement being such that when the barbs of opposing corresponding members being forced into interlocking relation have cleared the inner edges of the straps of the opposing members they snap outwardly while the straps recover inwardly to locate the locking shoulders in locking position behind the inner strap edges.

3,928,951

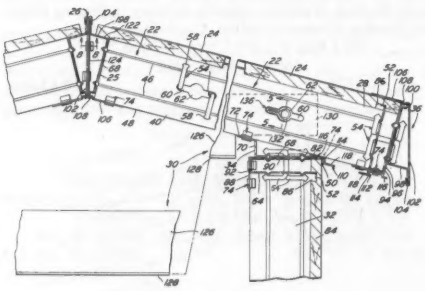
ROOF ASSEMBLIES FOR BUILDING STRUCTURES

Wesley T. Murphy, Auburn, N.Y., assignor to Vercon Products, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 160,018, July 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 85,533, Oct. 30, 1970, abandoned. This application June 6, 1973, Ser. No. 367,600

Int. Cl.² E04B *7/02*

U.S. Cl. 52—92 **14 Claims**



1. A roof assembly for a building including a planar roof panel, a rafter having a free end, said rafter supporting said roof panel directly thereon and an elongated tie bar connected to the rafter adjacent its free end, said rafter being supported adjacent its free end on the upper end of a vertical wall stud by a top wall plate and comprising a pair of elongated members, each of said members including a first longer wall and a second shorter wall, the first and second walls being spaced apart from each other but running generally parallel to each other and connected by a bridging section having an opening therein, each wall terminating in a free edge tab portion, said tabs defining a space therebetween in which an edge of said roof panel is disposed, said members being disposed adjacent each other with their long walls abutting and including aligned openings therein through which quick acting rotating clamp means extend to hold members together, said top wall plate comprising an angularly extending lip on which said rafter is mounted and having an opening aligned with the opening in said bridging section of said elongated member and resilient clip means disposed within said aligned openings and securing said rafter to said top wall plate.

3,928,952

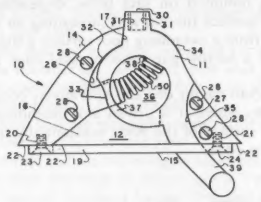
ANTENNA MOUNT

Thomas P. Whyte, 912 Warrington, Deerfield, Ill. 60015

Filed June 4, 1975, Ser. No. 583,545

Int. Cl.² H01Q *1/08*

U.S. Cl. 52—110 **9 Claims**



1. An antenna mount apparatus for mounting an antenna onto a vehicle comprising:

a base member including a bottom adapted to be secured to a vehicle surface, a cavity having a concave cam surface on a first wall thereof and a convex cam surface on a second wall thereof, said first and second walls being opposite and facing one another, and an elongated slot in the top of said base member and separating said cam surfaces;

a pivotable member within said cavity having a receptacle extending through said elongated slot and adapted for receiving an antenna to be mounted, said pivotable member being pivotable between a first position and a second position, said pivotable member also including a first convex peripheral surface portion and a shallow concave peripheral surface portion, said first convex peripheral surface portion extending from said receptacle and terminating integrally with said shallow concave portion, said first convex portion and said shallow concave portion facing said concave cam surface when said pivotable member is in said first position, and a second convex peripheral surface portion and a second concave peripheral surface portion, said second convex peripheral surface portion extending from said receptacle to and integrally terminating with said second concave peripheral surface portion, said second concave peripheral surface portion facing and engaged with said base convex cam surface when said pivotable member is in said first position; and

resilient means for resiliently holding said pivotable member in communication with said base member cavity walls; whereby,

when said pivotable member is in said first position, the antenna is disposed in a vertical semi-locked position with said second concave peripheral surface portion in engagement with said convex cam surface, and when said pivotable member is in said second position the antenna is disposed in locked acute position with said shallow concave peripheral surface portion engaged with said concave cam surface and said second convex peripheral surface portion engaged with said convex cam surface.

3,928,953

PACKAGED ADD-ON MULTIPLE GLAZING UNITS AND METHOD

Renato J. Mazzoni, Tarentum; George H. Bowser, New Kensington, and John L. Stewart, Murrysville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1974, Ser. No. 454,210

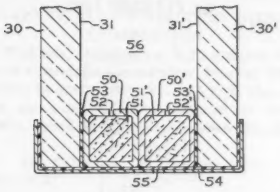
Int. Cl.² B65D *85/48;* **E06B** *3/28*

U.S. Cl. 52—172 **21 Claims**

1. A packaged assembly of glazing units comprising:

two discrete glazing subassemblies, each including a transparent pane and a spacer element affixed to marginal portions of one major surface of each said pane; said

subassemblies adjoining each other in opposed, substantially non-adhering relation, said spacers lying between said panes in substantial alignment with each other so as to form a substantially enclosed space between said panes; and



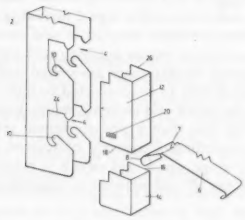
closure means adhered to edge surface portions of said adjoined subassemblies for retaining said subassemblies in the adjoining relationship.

3,928,954

LOUVRE SYSTEM

Alwyn Petrus Naude, c/o Architectural Sun Control (Proprietary) Ltd., Corner End and Commissioner Sts.., Johannesburg 2001, South Africa

Filed Apr. 18, 1974, Ser. No. 461,978
Int. Cl.² E06B *7/08*
U.S. Cl. 52—473 **9 Claims**



1. A louvre system including a louvre, at least two stringers located parallel to each other and supporting a louvre between them, characterized by each stringer being formed with a registering slot receiving the louvre and said slot wall and louvre having engaging means, an abutment comprising or associated with one edge of the slot, a locking piece separate from the stringer and in engagement with the abutment to clamp the louvre against the abutment, and locking means engaging between said locking piece and said stringer to maintain engaged said engaging means.

3,928,955

DOUBLE WINDROWING METHOD AND APPARATUS

Cecil L. Case, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed May 6, 1974, Ser. No. 467,458
Int. Cl.² A01D *91/00*
U.S. Cl. 56—1 **9 Claims**

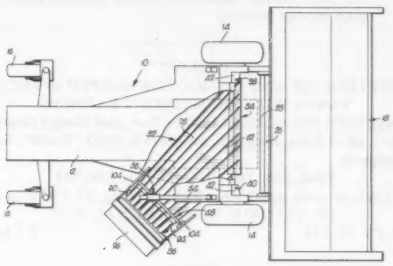
1. In a double windrowing method, the steps of: raising a swath of crop from a field while advancing thereacross in one direction;

reducing the width of the raised swath to form a narrower row of crop;

projecting the row of crop rearwardly generally parallel with the path of advancement;

transferring the projected crop obliquely of said path of advancement to one side of the latter without discontinuing the rearward momentum of the crop;

depositing the crop on the field within the lateral boundries of said swath of crop to produce a windrow alongside said path of advancement; and



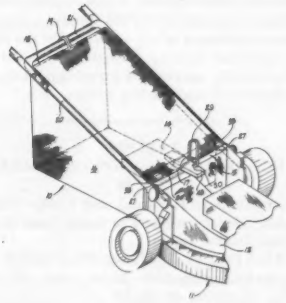
repeating said raising, reducing, projecting, transferring and depositing steps while advancing across the field in the opposite direction to produce a second windrow associated with the first.

3,928,956

REAR MOUNTED GRASS CATCHER

Walter J. Boyer, St. Louis, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Filed Nov. 29, 1974, Ser. No. 528,333
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **4 Claims**



1. In combination with a lawn mower housing of the type having a rearwardly extending handle and including a rear discharge opening, an upper wall and a hingedly mounted closure flap, said closure flap having a lever disposed above the upper wall for rotating the flap into an open condition in which the lever overlies the housing upper wall, a grass catcher and mounting assembly comprising:

a. bracket means attached to the housing and including transversely spaced forwardly extending portions overlying the housing upper wall,

b. a removable grass catcher including:

1. a fabric container having an opening at one end adapted to receive clippings through the discharge opening,

2. front mounting means including front framing means for said opening, said framing means including opposed side members and a transverse upper member spaced forwardly of said side members, said upper member having an intermediate portion disposed in operatively overlying relation with said flap lever and transversely spaced end portions disposed in operatively underlying relation with said bracket forwardly extending portions, said upper member intermediate portion provid-

ing an upwardly extending handle portion to facilitate installation of said catcher, and

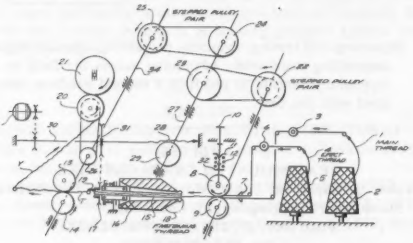
3. rear mounting means at said other end attachable to the lawn mower handle in spaced relation from said lawn mower housing.

3,928,957

METHOD OF AND DEVICE FOR SHAPED EFFECT YARNS WITH OR WITHOUT LADDERS

Georgi Mitov Petrov; Iliya Marinov Iliev, and Rangel Georgiev Ilov, all of Sofia, Bulgaria, assignors to DSO "Textil", Sofia, Bulgaria

Filed Aug. 26, 1974, Ser. No. 500,703
Claims priority, application Bulgaria, Aug. 27, 1973, 24402
Int. Cl.² D01H 7/88; D02G 3/34, 3/38
U.S. Cl. 57—18 6 Claims



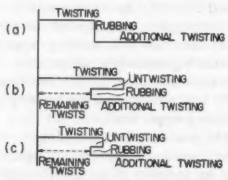
5. Apparatus for producing shaped effect yarns, comprising a rapidly rotating hollow spindle, a non-rotating bobbin carrying a fastening thread carried by the spindle, a pair of feeding rollers disposed upstream of the inner end of the hollow spindle for simultaneously feeding the main thread and the effects thread to the spindle, and means for continuously regulating the pressure between said feeding rollers.

3,928,958

METHOD FOR PRODUCING SPUN YARN-LIKE BULKED YARNS

Takeo Kurata; Tamotsu Hayazaki, and Kyoko Murakami, all of Takatsuki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,969
Claims priority, application Japan, Oct. 29, 1973, 48-120715; Mar. 19, 1974, 49-30625
Int. Cl.² D02G 1/20, 1/18, 3/34
U.S. Cl. 57—157 TS 12 Claims



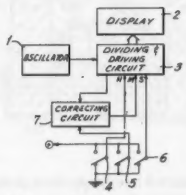
1. A method for producing spun yarn-like bulked yarns which comprises twisting plural yarns having difference in length of 3 to 40% in an optional direction at a twist coefficient of 10 to 140, rubbing thus twisted yarns to form loops and snarls in longer filament yarns and subsequently additionally twisting the yarns in the direction of the first twisting so that the twist coefficient becomes at least 5 to set the loops and snarls formed by the rubbing action.

3,928,959

ELECTRONIC TIMEPIECE

Okito Naito, Suwa, Japan, assignor to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed Jan. 11, 1974, Ser. No. 432,721
Claims priority, application Japan, Jan. 12, 1973, 48-5911
Int. Cl.² G04C 3/00
U.S. Cl. 58—23 R 5 Claims



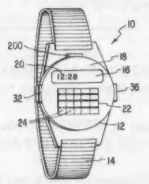
1. An electronic timepiece having a multi-digital display and comprising oscillator means for generating a relatively high frequency time standard signal; an electronic divider means having a plurality of stages coupled to said oscillator means and adapted to supply low frequency signals to said digital display that are representative of present time in response to said high frequency time standard signal, an intermediate stage of said divider means producing an intermediate frequency correction signal, correction circuit means for receiving said intermediate frequency correction signal from said intermediate stage of said electronic divider means, means for producing an index correction signal including one manually operated correction switch coupled to said correction circuit means, said correction means applying said index correction signal to a second divider stage associated with at least one displayed digit of time to be corrected to index the count of said stage by one when said switch is maintained in an operative position for less than a predetermined interval, and to apply said intermediate frequency correction signal to said second divider stage when said switch is maintained in said position in excess of said interval to repetitively index said digit.

3,928,960

COMBINATION WRISTWATCH AND CALCULATOR

Robert O. Reese, Lancaster, Pa., assignor to Time Computer, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 329,973, Feb. 6, 1973, Pat. No. 3,803,834. This application Mar. 28, 1974, Ser. No. 455,666
Int. Cl.² G04B 37/12, 19/30; G04C 21/32
U.S. Cl. 58—152 R 20 Claims



1. A combination wristwatch and wrist calculator comprising an electro-optical digital display, a time circuit having a plurality of time information outputs, a demand switch coupled to said time circuit for energizing said time information outputs only on demand, a calculator circuit having a plurality of calculator information outputs, a miniature keyboard coupled to said calculator circuit, common means coupling both said time and calculator information outputs to said display,

and a second demand switch coupled to said calculator circuit for energizing said calculator information output, said common coupling means comprising a plurality of driver transistors.

3,928,961

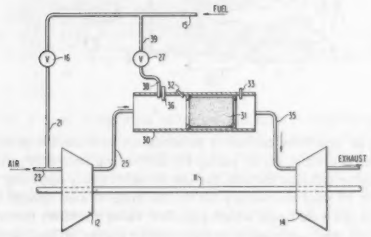
CATALYTICALLY-SUPPORTED THERMAL COMBUSTION

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. No. 142,939, May 13, 1971, abandoned, and a continuation-in-part of Ser. No. 164,718, July 21, 1971, abandoned. This application May 8, 1973, Ser. No. 358,411

Int. Cl.² F02C *3/04*; **F02M** *27/02*

U.S. Cl. 60—39.02 **42 Claims**



1. A method for the catalytically-supported, thermal combustion of carbonaceous fuel comprising (a) forming an intimate admixture of fuel and air, (b) contacting in a combustion zone at least a portion of said fuel-air admixture with solid oxidation catalyst occupying a major portion of the flow cross section of said combustion zone, and (c) thereby effecting sustained combustion of at least a portion of said fuel under essentially adiabatic conditions at a rate surmounting the mass transfer limitation to form an effluent of high thermal energy; said combustion being characterized by said fuel-air admixture having an adiabatic flame temperature such that upon contact with said catalyst, the operating temperature of said catalyst is substantially above the instantaneous auto-ignition temperature of said fuel-air admixture but below a temperature that would result in any substantial formation of oxides of nitrogen.

3,928,962

FUEL CONTROL SYSTEMS FOR GAS TURBINE ENGINES

Paul Mainwaring Maker, Birmingham, England, assignor to Lucas Aerospace Limited, Birmingham, England

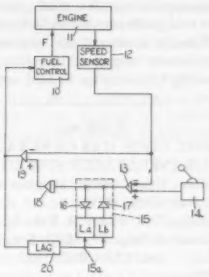
Filed Apr. 26, 1974, Ser. No. 465,142

Claims priority, application United Kingdom, Apr. 27, 1973, 20027/73

Int. Cl.² F02C *9/08*

U.S. Cl. 60—39.28 R **2 Claims**

1. A fuel control system for a gas turbine engine comprising means for producing an electrical signal corresponding to the actual engine speed, means for producing an electrical signal corresponding to the desired engine speed, a first difference amplifier connected to both of said means, and arranged to produce an error signal corresponding to the difference between the desired and actual speeds, a limit circuit which imposes a variable limit on the magnitude of said error signal, an integrator connected to produce an output corresponding to the time integral of the output of the limit circuit, a second difference amplifier connected to compare the output of the integrator with the signal corresponding to the actual speed and an electrically actuated fuel flow control for controlling the fuel flow to the engine, in accordance with the output of



the second difference amplifier, said limit circuit being responsive only to the output of the second difference amplifier.

3,928,963

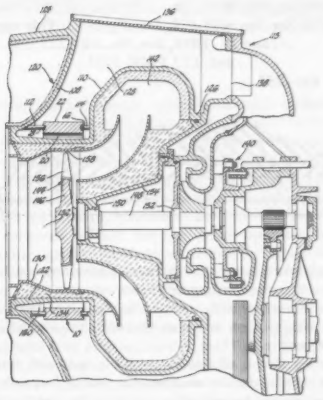
CAST IN PLACE GAS TURBINE CONTAINMENT RING AND METHOD OF MANUFACTURE

Melvin W. Devers, Bay City, and William L. Felske, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 4, 1974, Ser. No. 520,498

Int. Cl.² F02C *7/12*; **F01B** *25/16*; **F01D** *5/08*

U.S. Cl. 60—39.66 **2 Claims**



1. In a gas turbine engine, a cast iron block having a central bore therethrough including an annular turbine shroud wall, means including a liner defining a burner exhaust gas passage, radially inwardly of said shroud wall, a turbine wheel having a plurality of blades directed radially outwardly of said wheel, each of said blades including a tip portion thereon located in closed spaced relationship to said liner, means for supporting said wheel for high speed rotation relative to said shroud, said block having spaced apart internal wall portions located radially outwardly of said shroud defining an air cooling passage formed in surrounding circumferential relationship to said shroud, a plurality of integral cast iron pins formed on said spaced apart internal wall portions, pins on one of said spaced apart wall portions defining a circular pattern thereon, pins on the opposite internal wall forming a second circular pattern thereon, a metal containment ring located in said cooling passage radially outwardly of said shroud having an inside diameter in spaced relationship to said casting shroud wall to

form a circumferential cooling space radially inwardly of each of said first and second circular pattern of pins, said metal containment ring including a pair of side walls thereon each having a continuous circumferential groove formed thereabout, each of said posts on said walls having the tip portions thereof formed in situ in one of said grooves to rigidly locate said metal containment ring in said cooling passage in radially spaced surrounding relationship to said turbine wheel.

3,928,964

PYROTECHNIC COOL GAS GENERATION METHOD FOR INFLATABLE STRUCTURE

Brian K. Hamilton, Utica, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 224,525, Feb. 8, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,453

Int. Cl.² C06D *5/00*

U.S. Cl. 60—219 **3 Claims**

1. A method of filling an air cushion assembly with a generated gas without the production of carbon monoxide and at a temperature less than about 2000° F., comprising burning a propellant grain to generate gas, passing said generated gas through a porous bed of oxidizer and coolant, further cooling said gas by mechanical heat exchange with a heat exchange surface after passing the gas through the bed, further treating the oxidized gas emerged from the porous bed with a separate coolant, and directing the generated gas to an air cushion assembly.

3,928,965

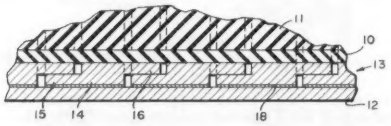
ROCKET MOTOR CONSTRUCTION

Albert W. Macbeth, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 413,477, Nov. 7, 1973. This application June 27, 1975, Ser. No. 591,227

Int. Cl.² F02K *9/04*

U.S. Cl. 60—255 **5 Claims**



1. In a rocket motor that includes a case and a solid propellant grain therein, the improvement comprising:

an elastomeric sheath surrounding and bonded to the propellant grain on surfaces thereof that are adjacent the case; and

a bearing sleeve of noncombustible material surrounding and bonded to the elastomeric sheath but unbonded to the case, the bearing sleeve formed by overlapping, helical windings of a continuous tape upon the elastomeric sheath, whereby expansion and contraction of the propellant grain relative to the case are permitted without harmful stress.

3,928,966

FLOW CONTROL VALVE FOR EXHAUST GAS RECIRCULATION SYSTEM

Kenji Goto, and Ryozo Mitsui, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

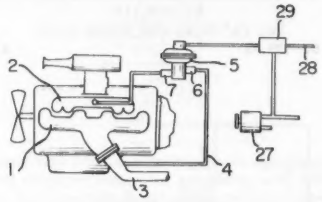
Filed Sept. 25, 1973, Ser. No. 400,674

Claims priority, application Japan, Nov. 30, 1972, 47-119436

Int. Cl.² F02M *25/06*

U.S. Cl. 60—278 **9 Claims**

1. A flow control system for circulating exhaust gases in an engine, including intake means for providing a combustible mixture to said engine and exhaust means for removing exhaust gases therefrom, said system comprising, in combination, means defining a first valve chamber and a second valve chamber, means defining a flow orifice between said first and second chambers, a valve body mounted for movement to open and close said flow orifice, means for delivering exhaust gases from said exhaust means to said first valve chamber, throttling means provided in said exhaust gas delivering means located to have said first valve chamber on the downstream side thereof, means communicating said second valve chamber with said intake means, a diaphragm connected with said valve body and mounted to have pressure in said first valve chamber applied to one side thereof to control opening and



closing of said flow orifice in accordance with said first valve chamber pressure, an air pump for delivering secondary air to said engine exhaust means, means for selectively applying the pressure of said secondary air to the side of said diaphragm opposite the side upon which said first valve chamber pressure is applied, and a pressure compensating piston affixed to said valve body and located to have pressure in said second valve chamber applied thereto, said piston being configured to generate a force upon said valve body resulting from application to said piston of said second valve chamber pressure which substantially equally counteracts the action of pressure from said intake means upon said valve body.

3,928,967

APPARATUS AND METHOD FOR EXTRACTING WAVE ENERGY

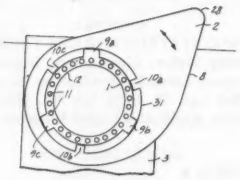
Stephen Hugh Salter, 143 E. Trinity Road, Edinburgh, EH53 PP, Scotland

Filed Nov. 6, 1974, Ser. No. 521,385

Claims priority, application United Kingdom, Nov. 15, 1973, 53119/73; May 6, 1974, 19763/74

Int. Cl.² F01D *25/00;* **F03G** *7/00;* **F04B** *35/00*

U.S. Cl. 60—398 **18 Claims**

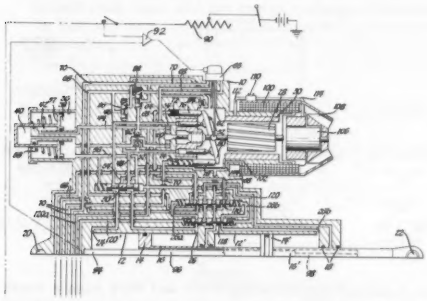


1. Apparatus for extracting energy from a wave pattern on the surface of a body of water comprising, a first body, a horizontal shaft supported by said first body, a second member pivotally supported on said horizontal shaft and having a vertical cross-sectional contour of asymmetrical shape with a rear circular portion having a radius centered at the center of said horizontal shaft and a forward generally pointed portion extending from said rear circular portion and means for generating power from relative motion of said body and said second member.

3,928,968
POWER TRANSMISSION

Kenneth F. Becker, Clarkston, and Nicholas F. Pedersen, Farmington, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 4, 1974, Ser. No. 512,263
Int. Cl.² F15B *11/22, 20/00*
U.S. Cl. 60—403 **2 Claims**

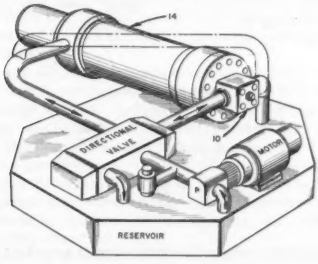


1. In a dual integrated actuator package comprising dual hydraulic actuators mechanically connected together and to a load to be selectively positioned by remote control, dual rotary electric prime movers, dual reversible variable displacement hydraulic pumps driven separately by the prime movers and each separately driving an actuator, and dual electro hydraulic servo controllers each controlling separately the displacement of a hydraulic pump, that improvement which comprises a pair of metering valve means, one being responsive oppositely to the pressures in the actuators to modulate the action of each servo controller for one direction of actuator motion, the other being responsive oppositely to pressures in the actuators to modulate the action of each servo controller for the other direction of actuator motion whereby the load is divided equally between the actuators.

3,928,969
SELF-MONITORED FLUID PRESSURE BOOSTER SYSTEM

Franck Picker, Oak Ridge, Tenn., assignor to Oak Ridge Machines, Oak Ridge, Tenn.

Filed May 24, 1974, Ser. No. 473,217
Int. Cl.² F15B *15/18*
U.S. Cl. 60—428 **21 Claims**



1. A self-monitored fluid pressure booster device comprising:

a. a body having a bore connectable to a fluid pressure operated mechanism and inlet port means and outlet port means connected to the bore;

b. a shiftable sliding means in the bore having means to control fluid flow to and from said outlet and inlet port means in response to pressure in the fluid operated mechanism;

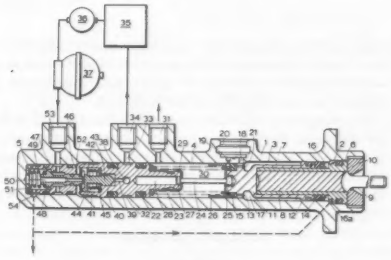
c. pressure converter means associated with said sliding means to convert a high volume low pressure fluid flow into a low volume high pressure flow;

d. said sliding means being mounted to shift from a first position in which the fluid control means directs the fluid flow from the inlet port into the mechanism to a second position in which the fluid control means directs the fluid flow from the inlet port through the pressure converter means to the mechanism and the outlet port means.

3,928,970
POWER ASSISTED MASTER CYLINDER ASSEMBLIES

Glyn Phillip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 28, 1973, Ser. No. 419,627
Claims priority, application United Kingdom, Feb. 20, 1973, 8177/73; Nov. 30, 1972, 55397/72; Dec. 1, 1972, 55567/72
Int. Cl.² B60T *11/20*
U.S. Cl. 60—562 **18 Claims**



1. A power assisted master cylinder assembly comprising a master cylinder which includes a body provided with a bore having inner and outer ends, a first piston moveable in said bore and having inner and outer portions, said inner portion bounding a pressure space inward of said piston for connection to a brake circuit, the outer portion of said piston being formed with an inwardly extending axial bore, a fixed sleeve slideably received in said bore, a pedal operated member extending through said fixed sleeve to directly engage said first piston, an annular closure member for closing the outer end of an annular space defined between said sleeve and said bore, first seal means between said piston outer portion, said sleeve and said bore, second seal means for sealing said closure member to said bore and said sleeve, said first and second seal means, said sleeve and said bore defining a sealed annular power chamber, an inlet to said power chamber for connection to a source of fluid under pressure and a control valve assembly which includes valve means for controlling the supply of fluid from said source to said power chamber, a second piston to operate said valve means, and means for transmitting movement of said first piston to said second piston; said pedal-operated member and pressure fluid in said power chamber acting in parallel on said first piston to prevent kick-back on said pedal-operated member on a rapid increase in pressure in said power chamber.

3,928,971
INTERNAL COMBUSTION ENGINE

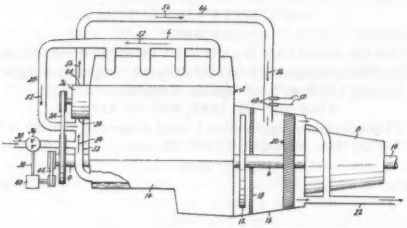
Tommy W. Spath, Box 13149, Kansas City, Kans. 66113

Filed Mar. 11, 1974, Ser. No. 450,051
Int. Cl.² F02G *3/00*
U.S. Cl. 60—614 **3 Claims**

1. In combination with an internal combustion engine emitting exhaust gases including combustible constituents and operable to turn a power output shaft:

a. a turbine drivable by gas under pressure and also operable to turn said power output shaft,

b. means operable to collect said exhaust gases, deliver them to said turbine, and burn them to supply expanded quantities of gas for driving said turbine, said means comprising a gas compressor driven by said internal combustion engine, a conduit connecting the exhaust manifold of said internal combustion engine to the intake of said compressor, means for admitting fresh air to the



intake of said compressor, a conduit connecting the outlet of said compressor to the gas inlet of said turbine, and ignition means operable to ignite said air-exhaust gas mixture at the inlet of said turbine, and

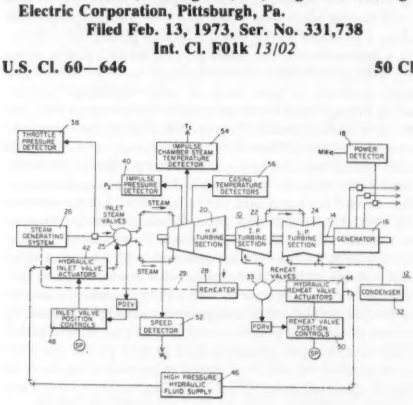
c. a throttling valve operable to regulate the amount of fresh air delivered to said compressor intake, and means responsive to the speed of operation of said engine to adjust said throttling valve, to render the quantity of air admitted directly proportional to the speed of operation of said engine.

3,928,972

SYSTEM AND METHOD FOR IMPROVED STEAM TURBINE OPERATION

Robert L. Osborne, Wallingford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 13, 1973, Ser. No. 331,738
Int. Cl.² F01k *13/02*
U.S. Cl. 60—646 **50 Claims**



1. An improved steam turbine system comprising:

a. A steam turbine having a portion subject to thermal stress when said turbine is in operation;

b. means for generating a heat flow representation of present heat flow to said portion from a predetermined region in heat transfer relation to said portion; and

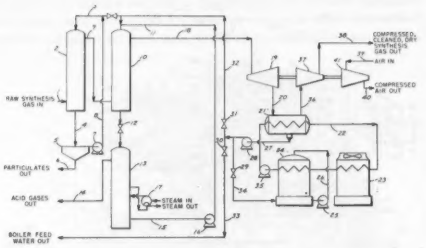
c. means for controlling operation of said steam turbine as a function of said heat flow representation, whereby said thermal stress is controlled.

3,928,973

PROCESS FOR EXTRACTING WATER AND ENERGY FROM SYNTHESIS GAS

John W. Hand, Aurora, Colo., assignor to Mintech Corporation, Denver, Colo.

Filed Aug. 12, 1974, Ser. No. 496,637
Int. Cl.² F01K *25/06*
U.S. Cl. 60—648 **4 Claims**



1. A process for extracting water and work from a conditioned, hot, moisture laden synthesis gas stream produced from solid carbonaceous matter and for pressurizing the dried synthesis gas for use in the catalytic synthesis of methanol, methane or ammonia, consisting of the sequential steps of:

a. cleaning the conditioned synthesis gas stream, under pressure, by scrubbing it with water and a solution of hot alkali salt;

b. passing said cleaned and water-saturated pressurized synthesis gas stream through an expansion turbine followed by a condenser;

c. extracting work from said expansion turbine by direct coupling of said turbine to one or more rotary compressors,

d. extracting water from the condenser for use as boiler feedwater and cooling water, and

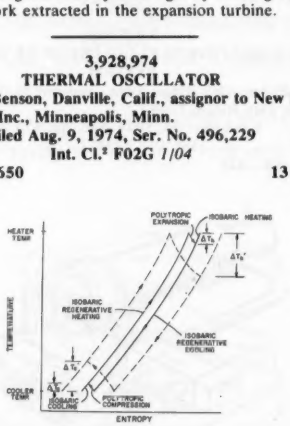
e. compressing the dried synthesis gas by utilizing a portion of the work extracted in the expansion turbine.

3,928,974

THERMAL OSCILLATOR

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Filed Aug. 9, 1974, Ser. No. 496,229
Int. Cl.² F02G *1/04*
U.S. Cl. 60—650 **13 Claims**



1. A thermodynamic cycle which subjects a working fluid to processing steps comprising:

regeneratively cooling the working fluid approximately isobarically;

compressing the working fluid to a prescribed pressure ratio, said compressing step including in combination polytropically compressing and approximately isobarically cooling the working fluid so as to approach an isothermal compressing step;

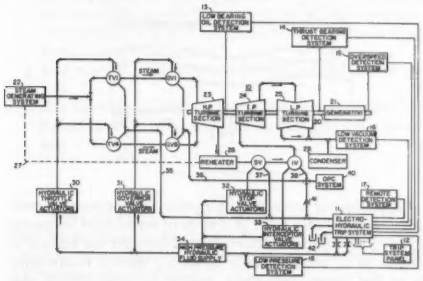
regeneratively heating the working fluid approximately isobarically;

expanding the working fluid to a prescribed pressure ratio, said expanding step including in combination polytropically expanding and approximately isobarically heating the working fluid so as to approach an isothermal expanding step; and said prescribed pressure ratios for said compressing and expanding steps being continuously varied to produce a net energy exchange per cycle that matches the instant cycle load, said net energy exchange determined by heat exchange rates in said compressing and expanding steps.

3,928,975
ELECTRICAL SYSTEM FOR ELECTROHYDRAULIC EMERGENCY TRIP SYSTEM

Andrew S. Braytenbah, Pennsauken, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1974, Ser. No. 477,115
Int. Cl. F01k *13/02*
U.S. Cl. 60—660 **10 Claims**



1. An electrohydraulic emergency trip system for a turbine power plant to close rapidly the steam inlet valves to the turbine in response to a predetermined contingency, comprising:

a plurality of steam inlet valves,

an operating mechanism for each steam inlet valve operative to close its associated valve in response to a predetermined decrease of fluid pressure in communication with such operating mechanism,

an hydraulic trip system in communication with the valve operating mechanism,

a first and a second electrically operable trip valve means operatively connected in the hydraulic trip system to decrease the fluid pressure in response to the operation of both the first and second trip valve means,

a first and second electrically operable contingency detection means,

first and second independent voltage sources,

first circuit means connected to both the first and second voltage sources to generate a third voltage output in response to the generated voltage from either one or both of the first and second voltage sources,

second circuit means including the first and second contingency detection means and the third voltage output to operate both the first and second contingency detection means in response to the opening and closing of the second circuit means,

third circuit means including the first contingency detection means and the first voltage source to operate the first trip valve means in response to the operation of the first contingency detection means,

fourth circuit means including the second contingency detection means and the second voltage source to operate the second trip valve means in response to the operation of the second contingency detection means,

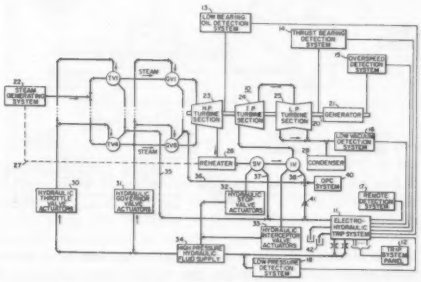
said third and fourth circuit means each being effective to operate their respective first and second trip valve means to an open position in response to a loss of the respectively connected first and second independent voltage sources, and

means to operate the third circuit means in response to a predetermined contingency.

3,928,976
ELECTROHYDRAULIC EMERGENCY TRIP SYSTEM FOR A TURBINE POWER PLANT

Andrew S. Braytenbah, Pennsauken, N.J.; Karl O. Jaegtnes, Chester, and Millard F. Smith, West Chester, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1974, Ser. No. 477,116
Int. Cl. F01k *13/02*
U.S. Cl. 60—660 **14 Claims**



1. An electrohydraulic emergency trip system for a turbine power plant to close rapidly the steam inlet valves to the turbine in response to a predetermined contingency, comprising

a plurality of steam inlet valves,

an operating mechanism for each steam inlet valve operative to close its associated valve in response to a predetermined decrease of fluid pressure in communication with such operating mechanism,

contingency sensing means normally in one condition and operative to a second condition in response to a predetermined contingency,

a source of fluid under pressure,

first and second independent voltage sources,

a first and second trip valve means, each operable electrically to an open and closed position,

an hydraulic system connecting the source of fluid under pressure and the first and second trip valve means and the steam inlet valve operating mechanisms to decrease the fluid pressure said predetermined amount in communication with the operating mechanism in response to the operation of both the first and second trip valve means to an open position only,

first circuit means connecting the first trip valve means to the first voltage source to close the first trip valve means in response to the voltage from the first voltage source when the first circuit means is in one condition and to open the first trip valve means in the absence of the voltage from the first source or when the first circuit means is in another condition,

second circuit means connecting the second trip valve means to the second voltage source to close the second trip valve means in response to the voltage from the second source when the first circuit means is in one condition and to open the second trip valve means in the absence of voltage from the second source or when the second circuit means is in another condition, and

third circuit means including the contingency sensing means responsive to the operation of the contingency sensing means to its second condition to operate both the first and second circuit means to their other condition.

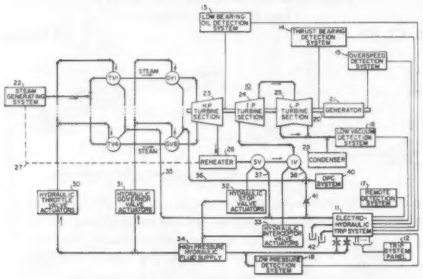
whereby the steam inlet valves are closed upon the occurrence of a predetermined contingency, but a loss of power from one of the sources does not operate to close the steam inlet valves.

3,928,977

ELECTROHYDRAULIC ON-LINE TESTABLE TRIP SYSTEM FOR TURBINE POWER PLANT

Andrew S. Braytenbah, Pennsauken, N.J., and Karl O. Jaegtnes, Chester, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1974, Ser. No. 477,117
Int. Cl. F01k *13/02*
U.S. Cl. 60—660 **11 Claims**



1. An electrohydraulic emergency trip system for a turbine power plant to close rapidly the steam inlet valves to the turbine in response to a predetermined contingency, comprising:

a turbine,

a plurality of steam inlet valves for controlling the admission of steam to the turbine,

a source of trip fluid under pressure,

an operating mechanism for each steam inlet valve operative to permit its associated valve to be controllably open in response to a predetermined trip fluid pressure and operative to close in response to a predetermined decrease of trip fluid pressure in communication with such operating mechanism,

a fluid draining means,

an hydraulic means connecting each operating mechanism in communication with the trip fluid under pressure and the fluid draining means to provide the predetermined trip fluid pressure when the draining means is closed and to decrease the trip fluid pressure when the draining means is open,

a first and second electrically operable trip valve means connected in series in the hydraulic means to close the draining means when one of the first and second trip valve means is closed and to open the draining means when both the first and second trip valve means are open,

a first and second contingency detecting means both operable to a trip condition in response to a predetermined operating contingency,

a first trip circuit means responsive to the operation of the first contingency detecting means to its trip condition to open the first trip valve means,

a second trip circuit means responsive to the operation of the second contingency detecting means to its trip condition to open the second trip valve means,

contingency simulation means operative when activated to simulate a trip contingency condition,

switching circuit means to activate the contingency simulation means to render selectively the first and second contingency detection means responsive to the simulated trip contingency condition,

means including the contingency simulation means and the switching circuit means to render one of the first and second cintingency detecting means operative to its trip condition in response to a predetermined contingency at times when the other of the first and second contingency detection means is activated by the contingency simulation means, and

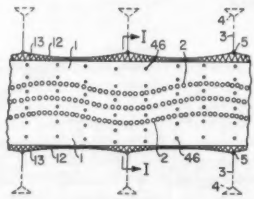
indicating means operatively associated with each of the trip valve means to indicate the operation of the respective first and second trip circuit means.

3,928,978

APPARATUS FOR PRODUCING AND PROTECTING DEPOSITS OF SEDIMENTARY MATERIAL ON FLOORS OF BODIES OF WATER

Ole Jeppe Fjord Larsen, Fasanvaenget 62, 6733 Hjerting, Denmark

Division of Ser. No. 212,056, Dec. 27, 1971, Pat. No. 3,844,123. This application Oct. 25, 1974, Ser. No. 518,050
Int. Cl.² L02B *3/04*
U.S. Cl. 61—3 **3 Claims**



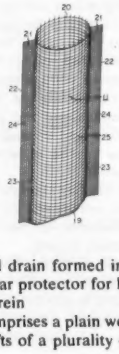
1. Apparatus for producing and protecting deposits of sedimentary material on a floor of a body of water, said apparatus comprising an elongated sheet located beneath the surface of the water in at least partially upwardly spaced relationship close to but above said floor, means for maintaining said elongated sheet so positioned, said maintaining means are a plurality of elements supporting said sheet along spaced points of the length thereof, and said sheet is of undulating configuration as viewed in transverse cross section along the length thereof.

3,928,979

FLEXIBLE SAND DRAIN FORMED IN A CASING

Osamu Terashima, Tokyo, and Ikuo Okabayashi, Yamato, both of Japan, assignors to Chiyoda Chemical Engineering and Construction Co., Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 381,587, July 23, 1973, Pat. No. 3,859,798. This application Dec. 3, 1974, Ser. No. 529,231
Claims priority, application Japan, May 22, 1973, 48-56378
Int. Cl.² E02B *11/00;* **E02D** *5/40*
U.S. Cl. 61—11 **5 Claims**



1. In a flexible sand drain formed in a casing, including a sand pillar and a tubular protector for holding the sand pillar, the improvement wherein

a. said protector comprises a plain woven fabric constituted by warps and wefts of a plurality of water-repellent, an-

tiweathering, chemically noncorrosive monofilaments so intermeshed as to make interfilament meshes large enough to allow sand to freely pass out of the protector; b. said warps intersect with said wefts at right angles and extend lengthwise of the protector so as to restrict the elongation of the protector;

c. said protector is provided with a pair of lugs having a higher mechanical strength and rigidness than those of the main body of the protector, comprising warps and wefts of said monofilaments and extending in a diametrically opposed relation along the full length thereof to prevent the protector from being twisted when the protector with a weight member fixed to the lower end of the protector is lowered into the casing driven into a poor subsoil;

d. the number of said warps of said lugs per unit length of the wefts thereof is 2 to 3 times greater than the number of said warps of the main body of said protector per unit length of the wefts thereof;

e. said protector when packed with sand has a diameter of 5 to 15 centimeters;

f. said protector has an elongation of less than 5 percent, and a lengthwise tensile strength of 80 to 120 kilograms and crosswise tensile strength of 60 to 180 kilograms per 5 centimeter width of the protector as measured when the protector is flattened;

g. said monofilaments have a fineness of 300 to 500 denier; and

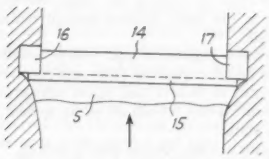
h. the sand drain when installed in the soft ground can be flexed so as to cope with the movement of the poor subsoil.

3,928,980

INFLATABLE WATER-RETAINING BARRIER

Jean Victor Ganzinotti, Brive, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Paris, France

Continuation-in-part of Ser. No. 77,297, Oct. 1, 1970, abandoned. This application Oct. 23, 1973, Ser. No. 408,443
Claims priority, application France, Oct. 6, 1969, 69.34082
Int. Cl.² E02B *7/20*
U.S. Cl. 61—29 **14 Claims**



1. A water retaining barrier means of unitary structure for a watercourse, said water retaining barrier means having upstream and downstream sides and comprising:

a. at least one flexible membrane forming at least one inflatable enclosure,

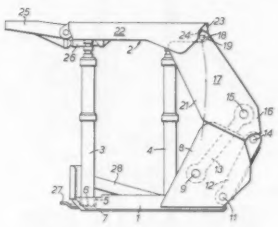
b. a rigid, mechanically strong, member of which at least a substantial portion is disposed within, and secured to, said at least one inflatable enclosure in a position to lie at least across the bed of the watercourse and the upstream side of the barrier means, said rigid member extending along the whole length of said barrier means, whereby when said barrier means is positioned in the watercourse, the ends of said rigid member bear freely against the banks of the watercourse and any stresses on the barrier means are distributed along the whole length of the barrier means and thereby the strain of holding the said barrier means in position is transferred laterally to the banks of the watercourse.

3,928,981

MINE PROOF SUPPORT

James Eric Parker, and Nigel Hill, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Oct. 11, 1974, Ser. No. 514,262
Claims priority, application United Kingdom, Oct. 18, 1973, 48621/73
Int. Cl.² E21D *23/04*
U.S. Cl. 61—45 D **4 Claims**



1. A roof support for use in a mine comprising, a roof-engaging canopy, a floor-engaging beam, a plurality of variable length struts extending between the floor beam and the canopy, and guide means comprising a first link pivotally connected at one position to the floor beam, a second link pivotally connected at another position to the floor beam spaced from the one position, a third link pivotally connected at spaced positions along its length to the first and second links and an extension fixedly secured to the third link and pivotally connected to the canopy, such that the center of the pivotal connection to the canopy is limited by the links and the extension to move solely in a fixed path approximately at right angles relative to the plane of the floor beam, the first link, the third link and its extension being arranged to extend substantially the full width of the support to form a shield and the pivotal connection to the canopy being arranged to permit angular tilting movement of the canopy relative to the floor beam about a longitudinal axis and a transverse axis both of which lie parallel to the plane of the canopy and to resist angular movement relative to the floor beam in the plane of the canopy.

3,928,982

METHOD AND DEVICE FOR A FOUNDATION BY DEPRESSION IN AN AQUATIC SITE

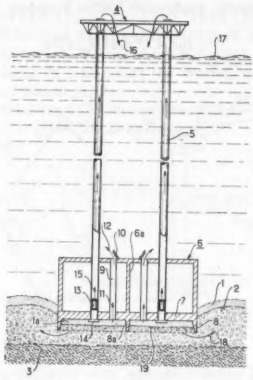
Roger Lacroix, Sceaux, France, assignor to Sea Tank Co., Paris, France

Filed Mar. 5, 1974, Ser. No. 448,436
Claims priority, application France, Mar. 5, 1973, 73.07739
Int. Cl.² E02D *27/52*
U.S. Cl. 61—50 **4 Claims**

1. In an underwater foundation structure for controlled submerged depression in an aquatic site, including: a tank having an apron forming the bottom of said structure with a ridge projecting downwardly therefrom and digging into the ground, which ground comprises at least two stratified layers in the form of a surface layer of permeable sand resting on an impermeable layer of clay, the improvement comprising:

said ridge having a height greater than the thickness of said sandy layer and extending continuously about the periphery of said apron to enclose the sandy layer within a confined space between said apron, the ridge and said clay layer after initial submergence of said tank, tubular funnels extending vertically through the tank from said apron to the top of said tank with said funnels being provided with closures at their upper ends to permit the removal of water trapped beneath said apron during initial submergence of said foundation structure, tubular

drains extending through the tank and having their lower ends entering the sand layer and their upper ends projecting above the surface of the water of the aquatic site, filters provided at the lower ends of said drains where the drains enter the sandy layer to insure the removal of



water, and pumps housed internally of the drains for pumping water through the drains to create said depression and for expelling water from the upper ends of the drains captured within the layer of permeable sand above the surface of said aquatic site.

3,928,983

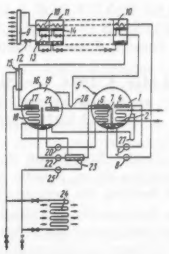
METHOD OF PRODUCING COLD IN AN ABSORPTION-YPE REFRIGERATING PLANT PERFORMING THIS METHOD

Emmanuil Gershkovich Ainbinder, bulvar Pushkina, 7, kv. 8; Georgy Vasilievich Kurilov, ulitsa Universitetskaya, 97, kv. 21, and Leonid Sergeevich Neustroev, ulitsa Artema, 127, kv. 42, all of Donetsk, U.S.S.R.

Continuation of Ser. No. 424,737, Dec. 14, 1973, abandoned, which is a continuation of Ser. No. 331,358, Feb. 12, 1973, abandoned, which is a continuation of Ser. No. 204,108, Dec. 2, 1971, abandoned. This application July 22, 1974, Ser. No. 490,864

Int. Cl.[2] F25B *15/06*

U.S. Cl. 62—101 **8 Claims**



1. A method of producing low temperatures and causing refrigeration, comprising the steps of:

absorbing the vapor of a coolant with a liquid absorbent;

directing said absorbent into a primary flow into a superheating zone thereof with the help of a high-temperature heat transfer medium under a high pressure;

maintaining the high pressure within said superheating zone to prevent boiling-up of the superheated absorbent;

reducing the pressure in a step-wise fashion in successive stages at successive portions of the flow of the absorbent, starting from the superheating zone, the pressure in each stage being reduced so as to provide for a momentary boiling-up of said superheated absorbent at a respective given temperature thereof;

returning said superheated absorbent from said superheating zone in counterflow heat exchange with the primary flow of said absorbent toward the superheating zone so that the vapor of said coolant produced at each stage of said return flow condenses and effects heat transfer inside the stage with respect to the cold primary flow of absorbent toward said superheating zone; and

returning the coolant condensate to an evaporator with a subsequent evaporation thereof at a low temperature due to the heat extracted from the object to be cooled and by absorbing the cold vapors with the liquid absorbent which is to be cooled by an outside source.

3,928,984

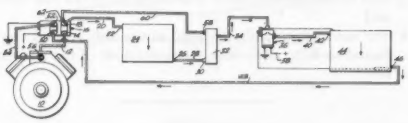
COMPRESSOR CYCLING UNIT

Claude H. Nickell, 17809 Oakwood Blvd., Dearborn, Mich. 48124

Filed May 22, 1974, Ser. No. 472,232

Int. Cl.[2] F25B *41/04*

U.S. Cl. 62—196 **5 Claims**



1. An air conditioning system for an automotive vehicle having a master control switch on the instrument panel and including a compressor cycling unit, said system comprising;

A. a compressor having,

1. a high pressure side, and
2. a low pressure suction side;

B. a condenser to receive a compressed gaseous refrigerant from said high pressure side and to convert same into a liquid state;

C. a receiver-dryer to receive the liquid refrigerant, said refrigerant in the upper portion thereof remaining in a gaseous state;

D. a combination expansion and system holding unit to receive the liquid refrigerant from said receiver-dryer;

E. an evaporator to receive said liquid refrigerant at a reduced pressure where it boils off, picks up heat, returning to a vapor state;

F. a compressor cycling control unit including,

1. a first inlet port from said high pressure side,
2. a first outlet port connecting with said condenser,
3. a second inlet port from said evaporator,
4. a second outlet port connecting with said low pressure side,
5. a valve means normally in a closed relation between an enlarged cylinder communicating with said first inlet port and first outlet port, and a chamber communicating with said second inlet port and second outlet port;

G. means to control said valve means comprising,

1. a longitudinal bore in said cycling control unit providing a first, enlarged portion and a second, reduced diameter portion;
2. a primary piston slidably engaged in said enlarged portion, normally seated against a stop means to define a bore chamber therebetween;
3. a secondary piston, spaced from said primary piston, slidably engaged in said reduced diameter portion;
4. a compression spring between said pistons to normally, forcibly maintain said spacing;
5. said electric circuit connecting between the control switch and an input terminal of said solenoid and from

an output terminal thereof to ground contacts to said secondary piston to the housing of said cycling control;

6. a third inlet port from said receiver-dryer upper section to said bore chamber, the pressure exerted on the gaseous refrigerant moving said primary piston against a shoulder stop defined by the juncture of said enlarged and reduced diameter bore portions;

7. by-pass conduit means connecting between said third inlet port and said secondary piston in a manner whereby pressure beyond said predetermined value moves said secondary piston towards said primary piston in opposition to the forces of said compression spring, opening said ground contacts, deenergizing said solenoid, opening said valve assembly to by-pass the refrigerant from said first inlet port through said second outlet port back to said low pressure side.

3,928,985

CONSTANT VELOCITY TORQUE TRANSMITTING UNIVERSAL JOINT

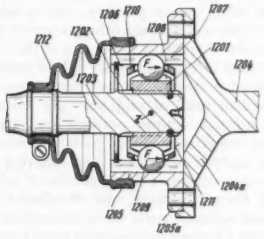
Sobhy Labib Girguis, Troisdorf, Germany, assignor to Uni-Cardan AG, Lohmar, Germany

Filed May 13, 1974, Ser. No. 469,601

Claims priority, application Germany, May 11, 1973, 2323822

Int. Cl.² F16D *3/30*

U.S. Cl. 64—21 **6 Claims**



1. A constant velocity torque transmitting universal joint comprising an outer joint member having a bore therethrough and a plurality of grooves in the surface of said bore, an inner joint member within said bore and having a plurality of grooves in the outer surface thereof opposing said outer joint grooves, a ball in each pair of opposed inner and outer joint member grooves, the balls being disposed in a plane passing through the axes of the outer and inner joint members, the balls being subjected to a force due to play in the joints to displace the balls from the homokinetic plane, and means on the universal joint for increasing the angle between the plane passing through the balls and the axis of the inner joint member to control the alignment direction of the balls with respect to the homokinetic plane.

3,928,986

ADJUSTABLE DOFFER SUPPORT FOR HIGH PILE FABRIC KNITTING MACHINES

Thomas J. Thore, Tarboro, N.C., assignor to Glenoit Mills, Inc., New York, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,282

Int. Cl.² D04B *9/14*

U.S. Cl. 66—9 B **6 Claims**

1. In a sliver feeding device for a high pile fabric knitting machine having a circle of needles, said device having a main cylinder and a doffer, with the doffer being disposed between the main cylinder and the needles and mounted on a rotatable shaft, an adjustable support for mounting the doffer selectively relative to the needles and main cylinder, comprising:

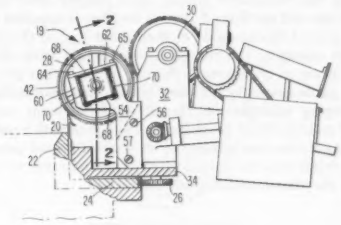
a. a pair of spaced stationary yokes for supporting the doffer shaft,

b. a cavity in each yoke,

c. a bearing block in each cavity having capacity for multi-directional transverse movement within the cavity,

d. said bearing blocks retaining the doffer shaft rotatably,

e. adjustment means within the cavities for displacing the bearing blocks transversely, to locate the bearing blocks at selected positions within the cavities, with consequent mounting of the doffer selectively relative to the needles and main cylinder,



f. said adjustment means comprising spaced, opposing groups of interchangeable spacers, the spacers of each group being transferrable selectively to their opposite group of spacers,

g. retention means to maintain the bearing blocks against both transverse and axial displacement at each of their selected positions within their cavities, and

h. said retention means including pins within each cavity engageable with channels in the bearing block in the cavity.

3,928,987

THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

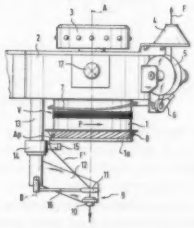
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 8, 1974, Ser. No. 495,880

Claims priority, application Germany, Aug. 16, 1973, 2341498

Int. Cl.² B65H *51/20*

U.S. Cl. 66—132 R **3 Claims**



1. In a thread supply device for a textile machine, in particular a knitting machine, said thread supply device including drum means upon which a thread can be tangentially wound to form an intermediate thread storage and from which the thread can be unwound axially over a withdrawal rim associated with the drum means, a thread control member positioned adjacent the withdrawal rim of said drum means for engaging the withdrawn thread to limit the withdrawal rate of thread from said drum means substantially to the rate at which thread is wound on the drum means to thereby provide a positive thread supply, and a thread guide assembly disposed in substantial alignment with the longitudinal axis of said drum means for guiding the thread withdrawn from said drum means after it passes over the withdrawal rim, the thread guide assembly including a first thread guide element aligned with

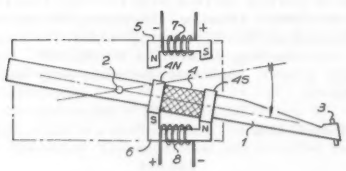
the axis of said drum means and disposed in engagement with the withdrawn thread, the thread guide assembly including a second thread guide element disposed adjacent the first thread guide element and means mounting the second thread guide element for pivotal movement substantially transversely relative to the thread passage therepast, the second thread guide element being substantially coaxially aligned with the axis of said drum means during positive thread supply, and spring means coacting with said second thread guide element for urging same transversely away from its position of alignment with the axis of said drum means, comprising the improvement wherein the withdrawn thread after passing over the withdrawal rim and the thread control member is supplied directly to the second thread guide element, said second thread guide element engaging the thread as withdrawn from the drum means prior to engagement thereof by any other part of the thread guide assembly, and said spring means normally swingably urging said second thread guide element outwardly toward an area which is substantially aligned with a part of the withdrawal rim over which the withdrawn thread passes as it moves relative to the thread control member due to a reduction in the thread withdrawal tension.

3,928,988

MAGNETIC CONTROL DEVICE FOR YARN GUIDES

Claus-Peter Lüth, Via delle Cave di Monteripaldi 55, Firenze, Italy

Filed Aug. 10, 1973, Ser. No. 387,517
Int. Cl.² H01F 7/00
U.S. Cl. 66—138 **4 Claims**



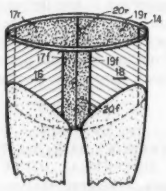
1. In a circular knitting machine having a needle cylinder and a plurality of yarn guides arranged about said cylinder and selectively movable into and out of operating position, the combination of a magnetic control device operatively connected with said yarn guides and responsive to electrical energization to selectively actuate said yarn guides, said magnetic control device comprising a movable component and two stationary components, characterized in that it includes: on each said stationary component, two opposite and symmetric magnetic circuit components designed to alternately cooperate with a magnetic circuit formed on the movable component in such a manner as to establish the closure of a magnetic circuit on one of the stationary components according to the position assumed by the movable component; means to establish a constant magnetic polarization in said magnetic circuit on the movable component in order to stablize the position of said movable component against one of the stationary components of the magnetic circuit by effect of magnetic attraction, and solenoid means arranged to reverse the polarity to create a magnetic repulson effect between one of said stationary components and the movable component which is located against said stationary component.

3,928,989

METHOD OF MANUFACTURE OF TUBULAR KNITTED ARTICLES, AND ARTICLES, PARTICULARLY TIGHTS, OBTAINED BY THE SAID METHOD

Bernard Giberstein, Paris, France, assignor to DIM S.A., Autun, France

Filed July 5, 1973, Ser. No. 376,284
Claims priority, application France, Apr. 4, 1972, 73.12140
Int. Cl.² D04B 1/24, 9/16
U.S. Cl. 66—177 **3 Claims**



1. Method of manufacturing tights comprising the steps of: circularly knitting two symmetrical long tubular stockings and providing in a minor circumferential portion of each of their upper parts on an interval having a center angle α a reduced elasticity by interlacing at least a part of the threads used for the circular knitting in this interval and normally knitting the threads in the other angular portions, cutting said two stockings symmetrically one with the other as mirror images along cut lines substantially parallel to the axis of the tubular stockings and provided in the upper part of said stockings in said normally knitted portions, said cut lines being offset from respective median lines of said normally knitted portions, dividing said normally knitted portions into respective main parts and into respective reduced parts, and assembling said two stockings and joining them at front and rear seams along said cut lines to constitute a panty portion of said tights with two normally knitted portions, one of reduced surface area formed by said reduced parts being assembled at the front seam and forming a minor area on each side of said front seam of said panty portion and one of greater surface formed by said main parts assembled at the rear seam forming substantially all of the rear of said panty portion and with reduced elasticity portions of said minor circumferential portions adjoining both said front and rear normally knitted portions and extending over a major portion of the front parts of the panty portion thereby forming the panty portion from the upper assembled parts of said two stockings.

3,928,990

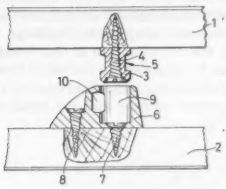
SKI LOCK

Rudolf Stenz, Neubiberg, Germany, assignor to Dipl.-ing. Rudolf Konwitschny, Taufkirchen, Germany

Filed Apr. 17, 1974, Ser. No. 461,624
Claims priority, application Germany, Apr. 18, 1973, 2319772
Int. Cl.² E05B 73/00; A63C 11/02
U.S. Cl. 70—58 **9 Claims**

1. A ski lock comprising a pin member having a locking groove adapted to be attached to a ski, a bush member adapted to be attached to another ski and having first means defining a first opening into which said pin member is inserted, said bush member having second means defining a second opening, said second opening extending through said bush member in a direction transverse to said first opening and communicating with at least a portion of said locking groove, locking means capable of being inserted into said second opening having a contour complementary to said second opening, said locking means further including a rotatable part which is lockable by a key, said rotatable part providing an offset relative to the contour of said locking means, and reten-

tion means on said bush member juxtaposed with said rotatable part to retain said locking means in said second opening



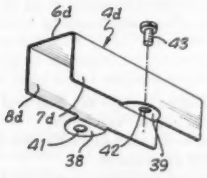
when said rotatable part is offset whereupon said key is removed.

3,928,991

LOCK

Ray A. Gaul, 1813 High St., Alameda, Calif. 94501, and Raymond J. Penoli, Jr., 20 Geary Court, Walnut Creek, Calif. 94596

Filed May 28, 1974, Ser. No. 473,392
Int. Cl.² E05B *15/00*
U.S. Cl. 70—364 A **3 Claims**



1. An improved lock which is invulnerable to operation by a gaff or air gun wherein the lock consists of a housing formed with pin cylinder openings in a pin cylinder block, a rotatable barrel formed with openings in registration with said pin cylinder openings, pin members slidably contained in said cylinder openings and biased by individual springs, and a removable cap covering said cylinder openings for containing said pins and springs, the improvement comprising:

a. means securing said cap to said lock body housing to prevent movement of said cap in a direction outwardly from said lock housing axial to said cylinder openings including:

1. said cap being formed with an end leg depending from said cap top member and being formed with a foot protruding at approximately right angles thereto and having an opening therein;
2. said lock body being formed with a threaded opening; and
3. a threaded fastener for attaching said cap to said lock body and insertable through said foot opening and into said lock body opening.

3,928,992

HIGH SECURITY LOCK

Donald Thomas Talbot, Wednesfield, England, assignor to Eaton Corporation, Ohio

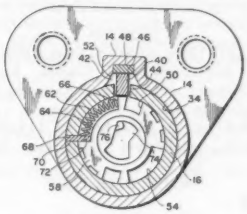
Filed July 24, 1974, Ser. No. 491,429
Int. Cl.² E05B *29/08, 47/00*
U.S. Cl. 70—366 **24 Claims**

1. A lock for use with a key for effecting actuation of a latching device, said lock comprising:

a housing having a substantially cylindrical bore therethrough;

a lock cylinder having a substantially cylindrical bore therein, said lock cylinder being received in said bore in said housing and being rotatable relative to said housing; latch actuating means operatively connected to said lock cylinder and rotatable therewith to effect actuation of the latching device;

locking means received in said bore of said lock cylinder and being rotatable relative thereto in response to the linear movement of the key into the lock;



coupling means for coupling said locking means to said lock cylinder, said coupling means coupling said locking means to said lock cylinder when said lock is in an unlocked condition permitting simultaneous rotation of said locking means and said latch actuating means to effect actuation of the latching device; and

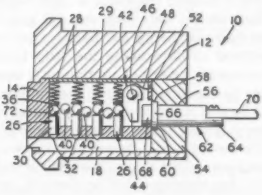
means for moving said coupling means to prevent engagement of said coupling means with said locking means when said lock is in a locked condition.

3,928,993

PICKPROOF CYLINDER LOCK

Norman Epstein, Carmel, N.Y., assignor to Norman Lock Co., Mahopac, N.Y.

Continuation of Ser. No. 388,428, Aug. 15, 1973, abandoned.
This application Aug. 29, 1974, Ser. No. 501,808
Int. Cl.² E05B *17/04, 25/00, 27/04, 63/00*
U.S. Cl. 70—419 **13 Claims**



1. A locking mechanism characterized by:

a body having a longitudinally extending key slot therein;

a lock-operating member mounted in the body for movement from a normal position toward a second position which it must occupy before the lock can be released;

a plurality of key-actuatable members movably mounted within the body;

means urging said key-actuatable members toward positions at which portions thereof are engageable by a key inserted into the key slot, and from which positions said key-actuatable members are movable to predetermine unlocking positions by a proper key in said slot;

and lock-release means connected to said key-actuatable members to move therewith, through which key produced motion of said key-actuatable members to their unlocking positions is translated into force on said lock-operating member to effect motion thereof to its said second position;

said lock-release means comprising a lock-release element carried by each of said key-actuatable members, said key-actuatable members having a normal lock-closed position in which said lock-release elements are maintained out of operative association with each other, said key-actuatable members in their unlocking positions retaining said lock-release elements in operative engagement with each other, with each element exerting a force upon the adjacent elements and said force being transmitted to said lock-operating member in a direction to move the latter to its said second position.

3,928,994

THICKNESS CONTROL SYSTEM FOR A ROLLING MILL

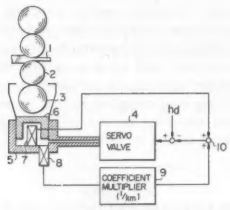
Ken Ichiryu, Mito; Masayuki Saigeta, Katsuta; Ichiro Nakamura, Katsuta, and Toshiyuki Kajiwara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 515,030

Claims priority, application Japan, Oct. 17, 1973, 48-115905

Int. Cl.² B21B *37/00*

U.S. Cl. 72—8 **12 Claims**



1. In a strip thickness control system of the gagemeter type comprising a plurality of rolls, a hydraulic jack for giving rolling power to said rolls, a flow rate control valve for adjusting the roll gap by controlling the amount of oil in said hydraulic jack, a valve control device, means for giving a command associated with a desired thickness to said control device and a position detector for detecting the roll gap, the output of said position detector being fed back to said valve control device; a method of controlling the strip thickness for the rolling mill comprising steps of continuously detecting a value of at least one parameter relating to the outgoing thickness of a strip rolled by said rolls, producing an autocorrelation function R of the detected value of said parameter, producing a power spectra for the whole region and a power spectra for a predetermined part of the region covered by said autocorrelation function, determining a roll eccentricity power from the ratio between said power spectra for the predetermined part of the region and said power spectra for the whole region, and applying said roll eccentricity power to the strip thickness control system so as to compensate for the variation of the outgoing thickness of the strip due to the roll eccentricity.

3,928,995

METHOD OF AND APPARATUS FOR PRODUCING ARTICLES HAVING HIGH MAGNETIC PERMEABILITY FROM BILLETS OF TEMPORARILY MAGNETIZABLE (I.E., SOFT MAGNETIC) MATERIAL

John Edward Oldis, Carmel, Ind., and Peruvemba Swaminatha Venkatesan, Princeton, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 428,948, Dec. 27, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 544,527

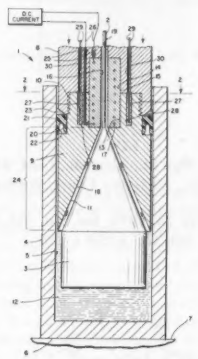
Int. Cl.² B21G *23/00*

U.S. Cl. 72—60 **6 Claims**

1. Apparatus for producing an article having high magnetic permeability from a billet of temporarily magnetizable material, said apparatus comprising:

a. a fluid control element having a flow control surface providing a zone of deformation having an entrance end adapted to receive the head end of a billet of temporarily magnetizable material and an exit end downstream from said entrance end adapted to discharge deformed material having the cross-section of the desired article,

b. first means to establish a controlled flow of pressurized extrusion fluid through the fluid control element between the flow control surface and the head end of the billet



from the entrance end to the exit end of the zone of deformation to deform said billet,

c. second means to advance said billet into the entrance end of said zone of deformation,

d. a magnetizing coil embedded in said fluid control element and extending from the exit end of the zone of deformation to a station downstream from said exit end and adapted to surround deformed material exiting the exit end of the zone of deformation,

e. a source of direct current connected to said magnetizing coil to energize said magnetizing coil.

3,928,996

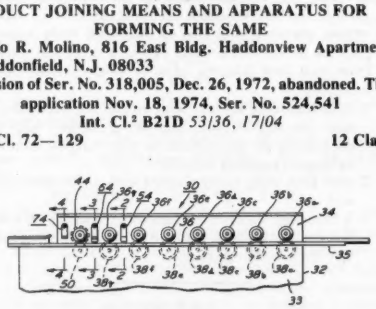
DUCT JOINING MEANS AND APPARATUS FOR FORMING THE SAME

Angelo R. Molino, 816 East Bldg. Haddonview Apartments, Haddonfield, N.J. 08033

Division of Ser. No. 318,005, Dec. 26, 1972, abandoned. This application Nov. 18, 1974, Ser. No. 524,541

Int. Cl.² B21D *53/36, 17/04*

U.S. Cl. 72—129 **12 Claims**

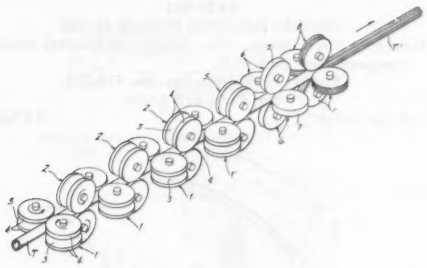


1. Apparatus for forming a duct joining member comprising die means for forming an upstanding U-shaped portion along a strip of sheet metal having a pair of legs each joined to a respective one of a pair of coplanar horizontal side flanges, and slitter means for forming spaced slits in the strip along and between the end of one leg of the U-shaped portion and one of said flanges.

3,928,997
METHOD AND APPARATUS FOR PRODUCING CORRUGATED TUBING

Harold H. Laws, East Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 28, 1975, Ser. No. 563,034
Int. Cl.² B21D *13/04*
U.S. Cl. 72—178 **10 Claims**



1. An apparatus for providing a longitudinally extended pattern on a metallic tube comprising:

A. a plurality of paired idling rolls, each roll of said pair possessing a continuous concave surface of semi-circular cross section located in the cylindrical surface thereof and both rolls located within the same plane;

B. a plurality of paired resilient drive rolls located in adjacent alternation with said idling rolls and in a plane perpendicular to the plane of said idling rolls, and possessing concave surfaces identical thereto, wherein said concave surfaces are lined with a resilient material;

C. at least one pair of non-resilient drive rolls of identical configuration to said resilient drive rolls and located beyond said resilient drive rolls, serving to size said tube;

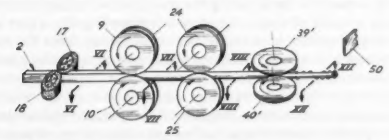
D. a set of 4 smooth turk's head rolls situated beyond said non-resilient drive rolls, arranged in two orthogonal axial planes the intersection of said axial planes corresponding to the central axis of the tube, each of said rolls having a smooth concave surface of quarter-circular cross-section located in its cylindrical surface, and all of said rolls positioned so as to lie within a single plane perpendicular to the longitudinal axis of said tube; and

E. means for forming said pattern on said tube comprising at least one patterned roll located in contact with said tube after its passage through said smooth turk's head rolls.

3,928,998
METAL ROD FOR REINFORCED CONCRETE AND PROCESS FOR PRODUCING SAID ROD

Hector Jose Torres, Buenos Aires, Argentina, assignor to Leonardo Francisco Aurelio, Buenos Aires, Argentina, a part interest

Filed Feb. 13, 1974, Ser. No. 442,008
Claims priority, application Argentina, Nov. 28, 1973, 251204
Int. Cl.² B21H *8/00*
U.S. Cl. 72—185 **7 Claims**



1. A process for producing a metal rod having a high yield point and good adhesive properties for use with reinforced concrete or the like, comprising the steps of:

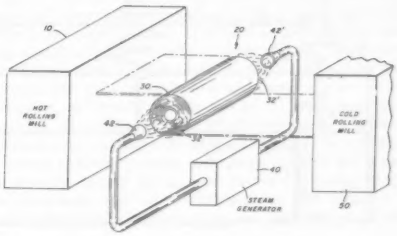
producing an elliptical rod having intersecting major and minor axes by subjecting a metal strip to cold compacting in order to reduce the cross-sectional area thereof and to increase the yield point of the metal constituting said elliptical rod;

applying pressure to said elliptical rod at peripheral locations thereof located at opposite ends of said major axis; allowing a portion of the metal at said locations to shift toward other peripheral locations of said rod, said other peripheral locations being at the opposite ends of said minor axis thereby increasing the amount of metal located at said other peripheral location while simultaneously maintaining another portion of the metal of said rod unshifted and substantially free of metalographic transformation, said another portion forming a core and studs and being located adjacent said major axis, the shifting of said material causing studs to be formed out at said peripheral locations while said shifted material transforms said elliptical rod to a circular rod having studs thereon.

3,928,999
PROCESS FOR TREATMENT OF COILED ALUMINUM SHEET

Arvid N. Anderson, and Wayne W. Binger, both of New Kensington, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 27, 1975, Ser. No. 553,672
Int. Cl.² B21B *45/02*; **B21D** *31/00*
U.S. Cl. 72—202 **7 Claims**



1. A process for inhibiting damage to rolls in a mill for cold rolling aluminum sheet which comprises:

a. coiling the aluminum sheet as it exits from a hot rolling mill; and

b. thereafter applying a spray of steam to the lateral edges of said coiled sheet prior to its entry into the cold rolling mill.

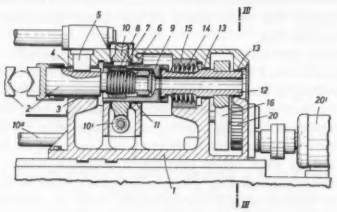
3,929,000
HIGH-SPEED SHORT-STROKE FORGING PRESS

Bruno Kralowetz, St. Ulrich 142, Steyr, Austria

Filed Oct. 18, 1974, Ser. No. 516,010
Claims priority, application Austria, Nov. 15, 1973, 9603/73
Int. Cl.² B21J *9/18*
U.S. Cl. 72—402 **5 Claims**

1. A high-speed short-stroke forging press, which comprises a machine frame at least one press ram mounted and guided in said machine frame for a straight-line movement relative thereto, and helical drive means carried by said machine frame and operatively connected to said press ram and operable to adjust the stroke position of said press ram and axially to reciprocate said press ram, and in which helical drive means comprise a cam ring fixed in said machine frame and formed on one side with helical cam faces, a cam follower mounted in said machine frame for angular and axial movement relative

to said cam ring and having helical faces which face said helical cam faces, biasing means for resiliently urging said helical faces of said cam follower against said helical cam



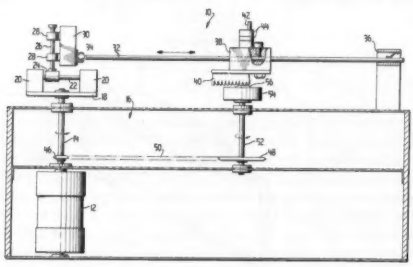
faces, and means for angularly oscillating said cam follower, said cam follower being axially fixed to said press ram and adapted to reciprocate the same.

3,929,001

DEVICE FOR TESTING WEAR RESISTANCE OF DENTAL RESTORATIVE MATERIALS

Henry L. Lee, 3534 E. California, Pasadena, Calif. 91107; Jan A. Orlowski, 1304 Rubio Drive, Altadena, Calif. 91001, and David V. Butler, 2825 E. Cortez, West Covina, Calif. 91791

Filed Apr. 29, 1974, Ser. No. 464,949
Int. Cl.² G01N *3/56*
U.S. Cl. 73—7 **1 Claim**



1. A device for use in testing the wear resistance of composite dental restoratives comprising:

a sample holder adapted to receive and hold a sample of composite dental restorative whose wear resistance is to be tested;

means connected to said sample holder for rotating the same;

means for abrading said composite dental restorative;

a mounting frame adapted to hold said means for abrading said composite dental restorative;

a reciprocating mechanism mechanically coupled to said mounting frame for stroking said abrading means held in said mounting frame cyclically across an exposed surface of said composite dental restorative held in said sample holder when said rotating means is operative;

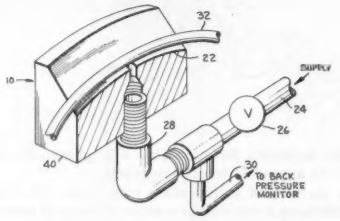
wherein said reciprocating mechanism comprises a motor having a shaft secured thereto; a rotatable coupling attached to said shaft; and an arm mechanically coupled between said rotatable coupling and said mounting frame; and wherein said rotatable coupling comprises a mounting plate secured to said motor shaft; a pair of mounting blocks secured to said mounting plate; a shaft secured within each of said mounting blocks and extending therebetween; said shaft being off-center from the axis of said motor shaft; an additional mounting block slideably engaging said shaft secured between said pair of mounting blocks and being adapted to be fixedly secured to said shaft; a shaft secured to said additional mounting block and projecting away therefrom; at least one collar rotatably secured to said shaft secured to said additional mounting block; a mounting block secured to said collar; and a ball joint attached to said mounting block secured to said collar and to said arm.

3,929,002

FLUIDIC GAUGING SENSOR HEAD

Hansjoerg Stern, Scotia, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,268
Int. Cl.² G01B *13/08*
U.S. Cl. 73—37.7 **2 Claims**



1. A fluidic gauging sensor head for monitoring a characteristic of a continuously moving strand-like monofilament material comprising:

a. a support block having an open channel bounded by converging side walls extending from a surface and lengthwise of said support block;

b. means for admitting pressurized fluid to said channel to sense variations in the back pressure therefrom proportional to changes in the characteristic of the material being monitored as the strand-like material passes through said open channel; and

c. means for establishing a substantially leak-proof seal between the monofilament material and said converging side walls bounding said channel to define an enclosed gauging area, said means for establishing a substantially leak-proof seal comprising said channel extending lengthwise in a convex arc, whereby the continuously moving monofilament material presses against said side walls bounding said channel to insure that the flow of the fluid through said gauging area is large compared to any leakage passing through the interface formed between the monofilament material and said side walls.

3,929,003

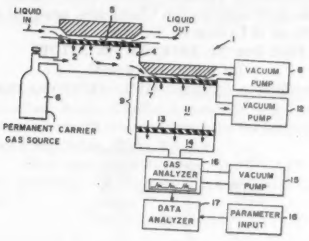
METHOD AND APPARATUS FOR DETECING MATERIALS IN A LIQUID

Peter M. LLewellyn, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 833,517, June 16, 1969, abandoned. This application Nov. 15, 1971, Ser. No. 199,025
Int. Cl. G01N *13/04*; **B01D** *13/00*
U.S. Cl. 73—61 R **35 Claims**

4. In a method for locating the source of a certain contaminate in a body of water the steps of, sampling the water at a plurality of points, separating the contaminant from the sampled water beneath the surface of the body of water by passing the contaminant through a generally water impervious membrane within the body of water which is at least semipermeable to the contaminant, diffusing the separated contaminant in a vaporized state into a carrier gas atmosphere, separating the contaminant vapor from the carrier gas atmosphere by passing the contaminant through a generally carrier gas impervious membrane which is at least semipermeable to the con-

taminant, diffusing the separated contaminant in a vaporized state into a carrier gas atmosphere, separating the contaminant vapor from the carrier gas atmosphere by passing the contaminant through a generally carrier gas impervious membrane which is at least semipermeable to the contaminant to enrich the contaminant concentration in the atmosphere on



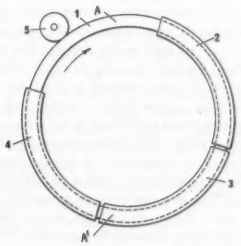
the downstream side of the membrane, analyzing the contaminant enriched atmosphere to detect the presence of the contaminant, and correlating the presence of the detected contaminant with the respective sampling points to derive an indication of the location of the source of the certain contaminant.

3,929,004

METHOD AND APPARATUS FOR MONITORING MATERIALS DISSOLVED OR SUSPENDED IN LIQUID

Dimiter Stefanoff Gunew, St. Albans, and Ronald John Herniman, North Balwyn, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 26, 1973, Ser. No. 419,102
Claims priority, application Australia, Dec. 15, 1972, 1644/72; June 21, 1973, 3792/73
Int. Cl.² G01N *31/08*
U.S. Cl. 73—61.1 C **19 Claims**



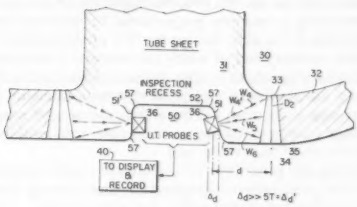
1. In a monitor for a liquid stream including a carrier liquid and at least one component dissolved or suspended therein comprising, in combination, a means for dispensing said liquid stream, a conveyor capable of receiving at least a part of said liquid stream, a carrier removal chamber or space traversed by said conveyor and maintained at a temperature selected to remove said carrier liquid and leave said component or components on said conveyor as a residue, means for heating said conveyor in a gasifying chamber to gasify said residue and means for monitoring said gasified residue to generate an output signal indicative of the presence of said component or components in said stream the improvements wherein firstly said conveyor comprises a non-supple annulus of which at least a part is porous and which is of uniform radius and mounted so as to be capable of axial rotation; and secondly said gasifying chamber surrounds a portion of said conveyor and includes bearing surfaces in engagement with the edge portions of said annulus in a manner such that said gasified residue is prevented from escaping from said gasifying chamber without first being exposed to said monitoring means.

3,929,005

ULTRASONIC INSPECTION RECESS IN HEAT EXCHANGER AND NUCLEAR STEAM GENERATOR TUBESHEETS

John K. Parkinson, 65 Dunvegan Road, St. Catharines, and Anthony Ruhe, 168 S. Pelham St., Fonthill, both of Ontario, Canada

Filed Aug. 1, 1974, Ser. No. 493,598
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 **5 Claims**



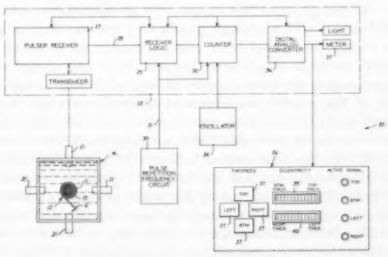
1. An improved system for non-destructive ultrasonic testing of a vessel weld seam utilizing an ultrasonic probe for testing for possible defects in said weld seam of said vessel, wherein the improvement comprises: a vessel having a circumferentially extending exterior U-shaped access slot, said slot having a wall substantially aligned with the weld seam, said wall forming a working surface of the slot is engaged by said transducer for generating frontal ultrasonic signals which substantially uniformly cross an axis of the weld seam with substantially no reflection from adjacent surfaces, the ultrasonic transducer responsive to reflected signals from said weld seam which indicate possible weld seam defects, the transducer movable in said slot so as to permit a scanning of the entire weld seam said slot disposed about said vessel at a distance substantially uniform along the entire length of the weld.

3,929,006

MEASURING ARTICLE THICKNESS ULTRASONICALLY

Luther Miles Boggs, Chamblee, and Howard John Flichman, Atlanta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 26, 1973, Ser. No. 419,170
Int. Cl.² G01B *17/02*; G01N *29/00*
U.S. Cl. 73—67.8 S **19 Claims**



1. A method of measuring the thickness of an article having

first and second surfaces bounding a material of known acoustical properties, which comprises the steps of:

establishing a medium having known acoustical characteristics contiguous with the first surface of the article;

generating a longitudinal wave in the medium directed toward the first surface, one part of the wave being reflected therefrom back through the medium, as a first echo, the other part of the wave passing through the first surface and the article to the second survace, and a portion of the other part being reflected back through the article and the medium as a second echo;

generating control signals to establish first and second predetermined minimum intensity levels and a time varying intensity associated with and greater than the first predetermined minimum intensity;

comparing the intensity of a first echo having the first predetermined minimum intensity level with the time varying intensity after a preset time and the intensity of a second echo with the second predetermined minimum intensity; generating a quantity proportional to the time interval between a first echo having the first predetermined minimum intensity and of which the intensity is less than the time varying intensity after the preset time and a second echo having the second predetermined minimum intensity and a duration during which the second predetermined minimum intensity is exceeded to establish the thickness of the article; and

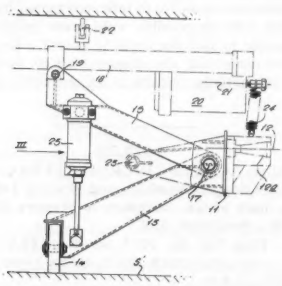
inhibiting the generation of any quantity when at least one of the predetermined minima or time varying intensity characteristics do not exist.

3,929,007

APPARATUS FOR CARRYING OUT ULTRASONIC INSPECTION OF PRESSURE VESSELS

Kenneth Henry Dent, Northwich, and Ronald Scott Challender, Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 13, 1973, Ser. No. 424,577
Int. Cl.² G01N 29/04
U.S. Cl. 73—67.8 S **3 Claims**



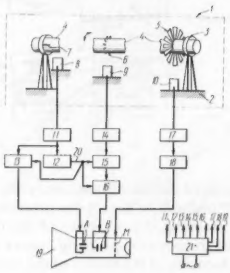
1. A manipulator for supporting an ultrasonic scanning transducer within a coolant nozzle of a nuclear reactor pressure vessel, the manipulator being arranged for carriage by a support member disposed within the vessel and comprising a caliper means including a pair of legs pivotable to span the bore of the nozzle, an ultrasonic transducer mounting attached to the free end of one leg of the pair of legs, and the pair of legs being pivotable about a manipulator axis extending between the legs and normal to the pivot axis of the legs, ram means connected to each leg for pivoting the legs together to enable free entry of the manipulator and ultrasonic transducer mounting into the nozzle and for pivoting the legs apart to span the bore of the nozzle, a plurality of roller members associated with the transducer mounting for making rolling contact with the interior surface of the nozzle and for spacing a transducer carried by the transducer mounting in an operable position relative to the surface of the nozzle, and a gimbal mount for mounting the transducer mounting on the free end of said one leg of the pair of legs.

3,929,008

APPARATUS FOR MEASURING AMPLITUDE OF VIBRATION OF ROTATING MACHINE PARTS

Boris Nikolaevich Zlotin, ulitsa Degtyarnaya, 12, kv. 8; Valentin Vyacheslavovich Timofeev, ulitsa Ordzhonikidze, 33, kv. 75, and Sergei Vladimirovich Chernenko, prospekt Geroev, 43, kv. 35, all of Leningrad, U.S.S.R.

Filed Dec. 31, 1974, Ser. No. 537,707
Int. Cl.² G01H 11/00
U.S. Cl. 73—71.4 **1 Claim**



1. An apparatus for measuring the amplitude of vibration of rotating parts of machines having a stator and a shaft with marks, mounting rotating parts, comprising: a first pulse sensor sensing a first mark of said shaft of said machine, said sensor being mounted on the stator of said machine; a second pulse sensor for sensing second marks of said shaft of said machine, disposed in the same plane with said rotating parts of said machine when the latter do not vibrate, the number of said second marks corresponding to the number of said rotating parts; said second pulse sensor being mounted on said stator of said machine opposite to said second marks; a third pulse sensor for sensing said rotating parts of said machine, mounted on said stator of said machine opposite to said rotating parts; a first pulse former for appropriately shaping pulses from a sensor, having its input connected to the output of said first pulse sensor; a second pulse former for appropriately shaping pulses from a sensor, having its input connected to the output of said second pulse sensor; a third pulse sensor for appropriately shaping pulses from a sensor, having its input connected to the output of said third pulse sensor; a horizontal scanning unit comprising a sawtooth generator with controlled sawtooth rise-time and having a first input connected to the output of said first pulse former, and a second input for feeding signals controlling the rise-time of sawtooth signal generated therein; a pulse delay unit at the output of said second pulse former, comprising a sawtooth generator with controlled sawtooth rise-time, having a first input connected to the output of said second pulse former, and a second input for feeding signals controlling the rise-time of a sawtooth signal generated therein; a vertical scanning unit comprising a sawtooth generator with controlled sawtooth rise-time, having a first input connected to the output of said pulse delay unit, and a second input for feeding signals controlling the rise-time of a sawtooth signal generated therein; a cathode-ray tube; horizontal-deflection plates of said cathode-ray tube connected to the output of said horizontal scanning unit; vertical-deflection plates of said cathode-ray tube connected to the output of said vertical scanning unit; a control electrode of said cathode-ray tube electrically coupled to the output of said third pulse former; a converter for converting pulse frequency into a signal proportional thereto, having its input connected to the output of said first pulse former and an output connected to

said second input of said horizontal scanning unit, to said second input of said pulse delay unit and to said second input of said vertical scanning unit; a screen of said cathode-ray tube on which a scan pattern is displayed during the operation of the apparatus, the scan pattern consisting of vertical lines whose number corresponds to the number of said rotating parts, each line displaying a spot which is defined by the instant of passage of a respective one of said rotating parts by said third pulse sensor, said spot displaying a displacement line, the length of the displacement line being proportional to the amplitude of vibration of said rotating part.

3,929,009

MEASUREMENT OF DRILLING TORQUE

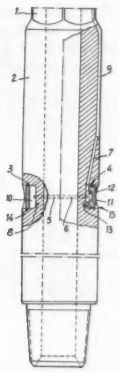
Jean Lutz, Pau; Andre Traille, Aussevielle, and Francois Besnard, Lescar, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed June 18, 1973, Ser. No. 370,677

Claims priority, application France, June 20, 1972, 72.22150

Int. Cl. G01l *3/10*

U.S. Cl. 73—136 A **7 Claims**



1. A device to supply a signal representative of the drilling torque comprising a Kelly defining an axial passage for drilling mud, at least one cavity near its lower end, and passage means distinct from said axial passage connecting said cavity to the upper end of said Kelly, a torque-measuring electrical bridge including at least four strain gauges located in diametrically opposed pairs inside said at least one cavity, electrical connections within said passage means which are likewise parts of the measuring bridge and serve to transmit the signal provided by said strain gauges to the top of the Kelly, and means for hermetically closing said at least one cavity.

3,929,010

METHOD AND MEANS FOR MEASURING THE CLAMPING FORCE ON TRANSFORMER WINDINGS

Ove Tjernstrom, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

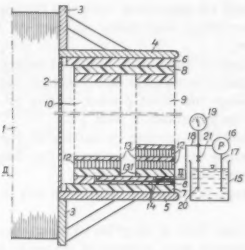
Filed Sept. 30, 1974, Ser. No. 511,302

Claims priority, application Sweden, Oct. 26, 1973, 73145427

Int. Cl.² G01L *5/00*

U.S. Cl. 73—141 R **2 Claims**

2. In a transformer having windings in which the windings are mechanically clamped between two clack rings which support the windings at their two ends, first clacks arranged within the clack rings and second clacks forming columns of clacks in the windings over which the clamping force is to be measured, some of the second clacks being in contact with the first clacks, at least one of the contacting clacks having a channel therein opening into a contact surface area between



the clacks and to the outside, means to supply pressure medium to said channel, and means to determine the pressure medium pressure at which there is a balance between added pressure medium and pressure medium leaking from said area.

3,929,011

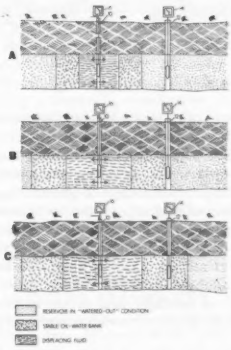
DETERMINATION OF OIL SATURATION IN AN ANISOTROPIC RESERVOIR

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 13, 1974, Ser. No. 532,351

Int. Cl.² E21B *49/00*

U.S. Cl. 73—155 **8 Claims**



1. A process of determining in situ the average oil saturation of an oil-bearing reservoir having an injection well in fluid communication with at least one observation well, comprising injecting into the reservoir a displacing fluid which will form a stable oil-water bank of the formation fluids within the reservoir and wherein the mobility of the displacing fluid is less than the mobility of the oil-water bank, determining the amount of the displacing fluid, comprised of a front portion and a back portion, required to displace the oil-water bank and the front portion of the displacing fluid to the observation well and thereafter determining the average oil saturation by the following formula:

$$S_{oi} = S_{ob} - \frac{V_{obt}}{V_{dbt}}\left(S_{ob} - S_{or} - f_{oi}\,\frac{V_{dbt}}{V_p}\right)$$

wherein

S_{oi} = average oil saturation between the injection well and the observation well prior to start of displacing fluid injection,

S_{ob} = average oil saturation in the oil-water bank

V_{obt} = cumulative volume in barrels of displacing fluid injected when the front portion of the oil-water bank arrives at the observation well,

V_{dbt} = cumulative volume in barrels of displacing fluid injected when the front portion of the displacing fluid arrives at the observation well

S_{or} = average residual oil saturation left by the displacing fluid

f_{oi} = fractional flow of oil prior to injection of placing fluid,

V_p = elliptical pore volume of reservoir bounded by the observation well.

3,929,012

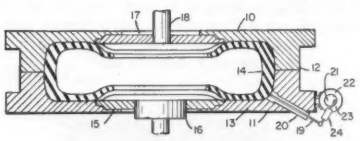
METHOD AND APPARATUS FOR OPTIMIZING CURE TIME OF ELASTOMERIC ARTICLES

Constantine E. Anagnostopoulos, St. Louis, Mo., and Raleigh W. Wise, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 791,031, Jan. 14, 1969. This application July 7, 1972, Ser. No. 269,859

Int. Cl. G01n *3/32*

U.S. Cl. 73—156 **2 Claims**



1. In a method of curing a staple elastomeric article under pressure within a mold wherein said article comprises at least one thick section and at least one thinner section and undergoes changes in modulus as curing progresses, the improvement which comprises the steps of embedding a slender probe in a thick section of said article, the tip of said probe being in the interior of said section, oscillating said tip embedded probe transversely at a frequency of from about 1 to about 1000 cycles per minute about a pivot line substantially perpendicular to a longitudinal plane of the probe, measuring the force required to oscillate said probe as curing progresses, opening the mold at a determined force and removing a vendible article.

3,929,013

DEFECT-DETECTING METHOD AND APPARATUS

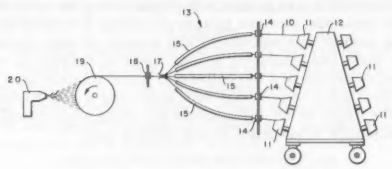
James E. Hendrix, Inman, and Hans H. Kuhn, Spartanburg, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 11, 1974, Ser. No. 459,943

Int. Cl.² G01N *21/06*

U.S. Cl. 73—160 **3 Claims**

1. A method for detecting defects in textile yarns comprising the steps of withdrawing yarns from packages, winding each yarn under substantially equal tension a plurality of wraps around a support surface with the wraps of each yarn being displaced from the wraps of adjacent yarns, applying a composition comprising a colorant and a solvent mixture to the yarn wraps on said support surface, permitting said composition to undergo phase separation, and comparing the resulting depths of shade of the respective yarn wraps.



3,929,014

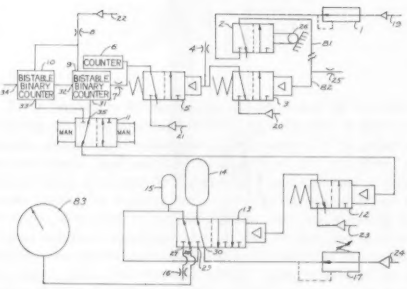
PERIODICALLY ACTUATED PNEUMATIC RATEMETER

Martin James Sharki, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 442,027, Feb. 13, 1974, abandoned. This application Dec. 30, 1974, Ser. No. 537,627

Int. Cl.² G01M *19/00*

U.S. Cl. 73—168 **28 Claims**



13. An apparatus for monitoring the rate of air impulses in an air line, comprising:

tank means for storing air;

pressure variation means for causing the pressure of air in said tank to vary at a predetermined rate;

display means for indicating air pressure;

gating means responsive to impulses from said line for alternately connecting said tank means to said pressure variation means and said tank means to said display means; and

means for removing periodic impulses from said line.

3,929,015

LINE MOTION AND WATER CURRENT DISC SENSOR

Michael L. Greene, Oxon Hill, and George J. Moss, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,278

Int. Cl.² G01F *1/28*

U.S. Cl. 73—170 A **4 Claims**

1. A line motion and water current disc sensor; which comprises,

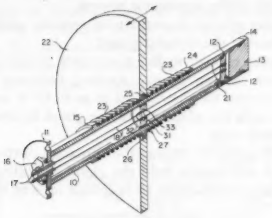
a cylindrical elongated housing;

noninsulated wires secured within said housing along a portion of its length;

a disc surrounding said housing and adapted for movement along said housing;

spring means on opposite sides of said disc for normally positioning said disc in a neutral position;

a magnetic follower within said housing;
said magnetic follower including an electrical contact thereon for completing an electrical circuit between said noninsulated wires; and

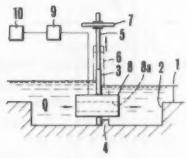


means on said disc for causing said magnetic follower to move simultaneously with movement of said disc.

3,929,016
FLOWMETER FOR AN OPEN AQUEDUCT

Kazuhiko Takeuchi, Fujisawa, and Ryoichiro Matsumoto, Yokohama, both of Japan, assignors to Yamatake-Honeywell Company, Ltd., Tokyo, Japan

Filed Mar. 12, 1975, Ser. No. 557,793
Claims priority, application Japan, Mar. 14, 1974, 49-28500
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM **1 Claim**



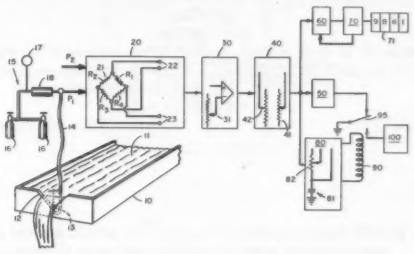
1. A flowmeter for an open aqueduct comprising
a sump in said aqueduct of a predetermined depth greater than the depth of said aqueduct;
a dam gate positioned across said aqueduct intermediate the ends of said sump; and
an electromagnetic fluid flow transducer having a central bore therethrough,
said electromagnetic fluid flow transducer being carried by said gate and positioned thereby to be completely submerged in the fluid in said sump, with the fluid flowing through the submerged bore of the transducer.

3,929,017
FLOW MONITOR AND SAMPLE CONTROL DEVICE

William S. Kowalski, Hinsdale, Ill., assignor to Elan Engineering Corporation, Hinsdale, Ill.

Filed Oct. 5, 1973, Ser. No. 403,841
Int. Cl.² G01F 1/20
U.S. Cl. 73—198 **18 Claims**

1. Apparatus for indicating rate of flow of a fluid comprising a weir arranged to receive said liquid thereover, a dip tube having its outlet end extended below the level of said liquid behind said weir at least to the depth of the throat of the weir, means for feeding at the other end of said tube a gas under pressure so that said gas is caused to pass in a continuous stream from the outlet end of said tube into said liquid, an electronic transducer sensitive to gas pressure when impressed thereon and which yields an output voltage proportional to said pressure, means for impressing upon said transducer the pressure of said gas which is passed through said tube, a function amplifier having a logarithmic function element set at a value of at least 1.0 and which is a constant for the shape of said weir, means connected with the output of said transducer



for impressing upon said amplifier a voltage which is proportional to the output voltage of said transducer, and means connected to the output of said amplifier for indicating a value proportional to the output voltage of said amplifier.

3,929,018
PROBE SYSTEM

Robert Bruce Turner, Weymouth, Mass., assignor to American Medical Electronics Corporation, Weymouth, Mass.

Filed May 6, 1974, Ser. No. 467,222
Int. Cl.² G01K 1/16, 7/16
U.S. Cl. 73—343 R **6 Claims**

1. A heat sensing probe system comprising a probe member, a heat sensitive element sealingly engaged with and mounted on said probe member, separate and independent of said probe cover, and a disposable probe cover for mounting on said probe member, said probe cover including a body section and a tip including a thermally conductive contact section sealingly interconnected with said body section, said tip being contiguous to and in sealed engagement with said probe member for forming a thermal chamber, between said probe member and said contact section, by said contact section and said heat sensing element being spaced from each other and a low thermal conductivity fluid medium for transferring heat from said contact section to said heat sensitive element.

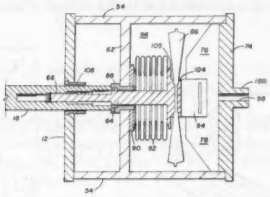
3,929,019
PRESSURE TRANSDUCER

James R. Younkin, Fayetteville, Ark., assignor to Edo - Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Filed Mar. 25, 1974, Ser. No. 454,365
Int. Cl.² G01L 9/12
U.S. Cl. 73—398 C **28 Claims**

1. A pressure transducer which comprises:
a frame;
a bellows secured at one end to said frame and having a movable end;
an aneroid element having a free side and secured at the opposite side to the movable end of said bellows with the sensitive axis of said aneroid coaxial to an axis of said bellows and bodily movable with the movable end;
actuation means fixed to the movable end of said bellows and extending through said bellows;
control means coupled to said actuation means and rotational relative to said frame to impart rectilinear move-

ment to the movable end of said bellows along the sensitive axis to said aneroid element; and



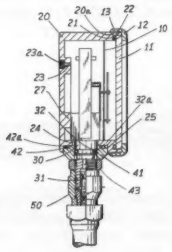
pickoff means coupled to the free side of said aneroid element along the sensitive axis and responsive to movement on the free side of said aneroid element relative to said frame.

3,929,020

LEAK-RESISTENT GUAGE

Reino Walter Honkanen, 17621 Irvine Blvd., Suite 101, Tustin, Calif. 92680

Filed May 20, 1974, Ser. No. 471,683
Int. Cl.² G01L *7/04*
U.S. Cl. 73—420 **12 Claims**



1. A guage, adopted to contain an instrument for measuring pressurized gas or vacuum, which is subject to leaking in the ambient environment, comprising in combination,

a housing having an opening for reading the instrument,

one or more ports for connections to be the source to be measured,

a threaded portion on the upper outer wall of the housing surrounding the opening,

a horizontal surface between the inner and outer surfaces of the housing wall forming the opening,

an annular groove to contain an annular sealing means on the horizontal surface,

a lens of transparent material,

a bezel to contain the lens threaded on the inside circumference to engage the threads on the outer housing wall and hold the lens in sealing engagement with the horizontal surface,

an instrument to measure an external source containing a connector means, a portion of which is threaded at the end opposite the instrument, the length of which is dimensioned to permit assembly into the housing from the inside, and a portion adjacent to the instrument which is larger than the port opening to position the instrument inside the housing and prevent pull through,

a safety vent and a pressure relief plug in the housing wall, a flat raised portion of the inside wall of the housing opposite the instrument reading opening to position the instrument within the housing during assembly,

a counterbored area or recess outwardly surrounding the port opening,

an annular gland dimensioned to at least partially be contained in the counterbore or recess and having a smooth bore circumferentially dimensioned to fit the unthreaded portion of the connector means,

an annular groove to contain an annular sealing means, on the face of the annular gland,

an annular groove in the connector means to contain an annular sealing means, located between the threaded portion and the instrument so as to be in sealing engagement with the gland when the gland is doweled into the recessed area,

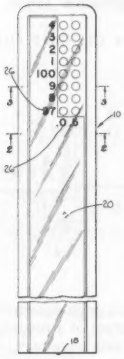
a nut, threaded to engage the threaded portion of the connector and axially hold the gland in sealing engagement with the counterbore or recessed face of the housing.

3,929,021

DISPOSABLE THERMOMETER

Saviour S. Pecorella, Howard Beach, N.Y., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Mar. 13, 1974, Ser. No. 450,866
Int. Cl.² G01K *11/06*
U.S. Cl. 73—356 **8 Claims**



1. A disposable, irreversible thermometer comprising: a base member; a transparent cover member overlying said base member; a temperature sensitive material carried by portions of said base member, said material being meltable at a predetermined temperature; a mask of absorbent material underlying portions of said transparent cover blocking said temperature sensitive material from view through said cover; said base and cover portions together defining a pocket; and means extending from said pocket to the exterior of said thermometer defining a vent for said pocket.

3,929,022

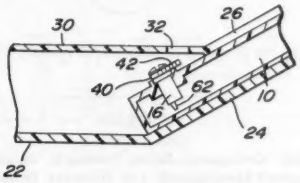
RECESSED METER IN A HOUSING AND METHOD OF ADJUSTING THE SAME

Alfred G. Ocken, Jr., Franklin Park, and William G. Skoda, Oak Park, both of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 31, 1974, Ser. No. 537,745
Int. Cl.² G01D *11/24*
U.S. Cl. 73—431 **18 Claims**

1. The method of adjusting an instrument having an adjustable set member, and mounted in a housing having a meter face surface and a base surface comprising the steps of:

a. affixing a toothed member to the adjustable set member of the instrument;
b. mounting the instrument in alignment with the meter face surface in a first plane of the housing having the base surface in a second plane oblique to the first plane;
c. positioning the toothed member below the base surface;
d. providing a window in the base surface for external access to the toothed member;
e. inserting an object suitable for engaging the toothed member through the window, and;



f. moving the toothed member with the object.

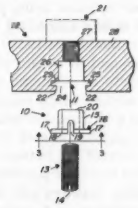
10. An instrument and housing including
an instrument having a readout viewable in a plane, the readout having a mechanical set adjustment accessible through the plane of readout view,
a housing having a first surface containing the instrument and a second surface, oblique thereto, provided with an access window, and
a toothed member mechanically coupled to the set adjustment and located under the window for external access to the teeth thereof.

3,929,023

TUNING SCREW LOCK AND TORQUE CONTROL

Pasquale Ambruoso, Sr., Coral Springs, Fla., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 27, 1974, Ser. No. 509,988
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.85 **6 Claims**



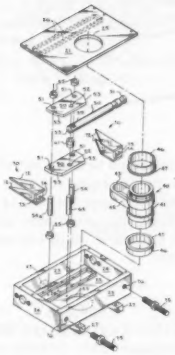
1. A tuning screw lock and torque control comprising:
a. a housing wall defining an aperture;
b. a tuning screw having predetermined characteristics; and
c. a molded resilient plastic insert, said insert being contained within and retained by the walls of said aperture; said aperture having cavity means for preventing axial motion of said insert, slotted means for preventing rotation of said insert, and shoulder means for retaining said insert; and
said insert having a body portion for threadedly mating with said tuning screw and for providing frictional resistance to said screw, flange means integral with said body portion for preventing axial motion of said insert and for providing locking action on said screw, and a slotted means extending through said flange means and through a substantial portion of said body portion for relieving excess stress on the material of said insert and for contributing to the locking action on said screw, and for contributing to the frictional resistance applied to said screw.

3,929,024

ACTUATOR

John M. Sheesley, and Ronald A. Gulick, both of Houston, Tex., assignors to Research Engineering Co., Houston, Tex.

Filed Oct. 10, 1974, Ser. No. 513,576
Int. Cl.[2] F01B *9/00*
U.S. Cl. 74—104 **3 Claims**



1. An valve actuator for translating a linearly directed force into an oscillatable, force, comprising:
a housing;
an oscillatable yoke adapted to receive a portion of a valve, said yoke positioned within said housing and including a hub portion and a slotted arm depending from said hub;
a movable member, movable along a first linear path, said member extending at least partially within said housing;
means linking said movable member with said yoke whereby linear movement of said movable member is translated into oscillatable movement of said yoke, said linking means including,
a. pressure exerting means, positioned at least partially within said slotted portion of said arm, and
b. said pressure exerting means comprising a pin member being movable along a second linear path, said second linear path being nonintersecting with said first linear path, and being intermediate the outer diameter of said hub and said first linear path.

3,929,025

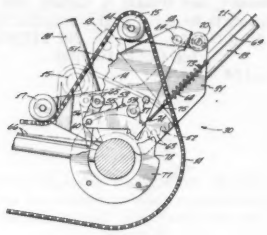
AUTOMATIC SHIFT CONTROL FOR BICYCLES AND THE LIKE

Robert E. Perry, 852 W. Las Palmas Drive, Fullerton, Calif. 92635

Filed Dec. 13, 1974, Ser. No. 532,509
Int. Cl.[2] F16H *9/00, 11/06*
U.S. Cl. 74—217 B **24 Claims**

1. An automatic shift control for a vehicle including a frame, at least one wheel, a crank, a chain interconnecting said wheel and said crank, and a means for changing the rotation ratio between said wheel and said crank comprising:
a control arm mounted for rotation around a fixed point on said frame, said arm being positionable in any one of multiple positions;
means interconnecting said control arm and said ratio changing means for selecting one of multiple ratios depending upon the position of said control arm;

a control arm idler wheel mounted on said control arm, said chain extending over said control arm idler wheel and forming an acute angle relative thereto, the resultant chain-tension force being in a direction to cause rotation of said control arm in a first direction; and



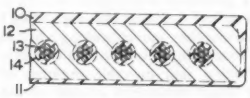
tension means connected to said control arm for applying a force in a direction to cause rotation of said control arm in a second direction opposite to said first direction, said control arm being approximately in equilibrium for a selected chain tension in all of said multiple positions of said control arm.

3,929,026

FOAMED CONVEYOR BELT

Dieter Albrecht Hofmann, 2419 Paliswood Road, S.W., Calgary, Alberta, Canada

Filed Apr. 12, 1974, Ser. No. 460,639
Claims priority, application Canada, Apr. 13, 1973, 168702
Int. Cl.² F16G *1/22, 1/00;* **B29H** *7/22*
U.S. Cl. 74—237 **6 Claims**



1. A belt comprising a longitudinally extending polyurethane shaped structure, said polyurethane structure comprising a central body of high density closed-cell polyurethane foam at least partly covered by an integral skin of higher density or substantially solid polyurethane, said foam having a density of at least about 15 lb/cu. ft.

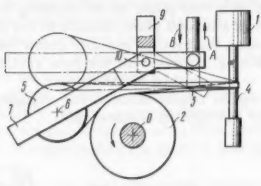
3,929,027

TWISTING MECHANISM DRIVE FOR SPINNING AND TWISTING FRAMES

Alexandr Alexeevich Sharychenkov, Ternovka, ulitsa Experimentalnaya, 1, kv. 67, Penza, U.S.S.R.

Filed June 4, 1974, Ser. No. 476,229
Int. Cl.² F16H *7/10;* **A01D** *45/02*
U.S. Cl. 74—242.15 R **2 Claims**

1. A drive for a twisting mechanism used in a spinning machine comprising a first drive shaft, a second shaft actuating the twisting mechanism, a rocking lever, a slide block mounted on the rocking lever, a tension roller carried by the slide block, an endless flexible coupling trained about the tension roller and the second shaft actuating the twisting mechanism, a tension member urging the slide block out of contact with the second shaft for placing the flexible coupling under tensions, and said rocking lever and tension roller being arranged relative to the first drive shaft so that the rocking motion of the lever urges the tension roller to engage the twisting mechanism by moving the flexible coupling to contact the first drive shaft and to disengage the twisting mechanism



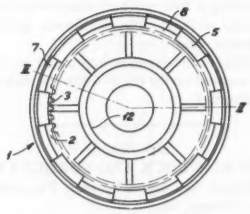
by moving the flexible coupling out of contact with the drive shaft.

3,929,028

GEARWHEEL

John Kirk Kirkegaard, Holte, Denmark, assignor to John Kirkegaard Maskinfabrik A/S, Hvidovre, Denmark

Filed Apr. 16, 1974, Ser. No. 461,342
Claims priority, application Denmark, Apr. 17, 1973, 2102/73
Int. Cl.² F16H *55/12, 55/30*
U.S. Cl. 74—448 **3 Claims**



1. A composite gear wheel comprising two concentrically engaged cylinders coterminal at one end, the inner diameter of the outer cylinder being equal to the outer diameter of the inner cylinder, the inner cylinder being provided at said one end with a first set of axially extending peripherally spaced projections which also extend in the radial direction outwardly of the inner cylinder beyond its outer cylindrical surface immediately adjacent thereto to define an outwardly extending edge engaging the end surface of the outer cylinder, the outer cylinder being provided with a second set of axially extending, peripherally spaced projections at said one end, each projection of the second set interfitting between successive projections of the first set and having a peripheral extension equal to the peripheral spacing between successive projections of the first set, the projections of said second set also extending radially inward of the outer cylinder beyond its inner cylindrical surface immediately adjacent thereto to define an inwardly extending edge engaging the end surface of the inner cylinder, one of said cylinders being composed of metal, and the other of said cylinders being composed of plastic and defining gear teeth on its cylindrical surface remote from said one cylinder.

3,929,029

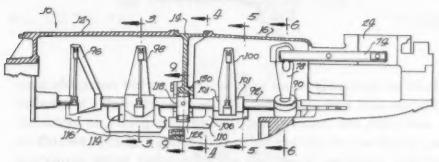
TRANSMISSION SHIFT CONTROL LINKAGE

Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 25, 1974, Ser. No. 445,373
Int. Cl.² B60K *23/00;* **G05G** *5/00;* **F16H** *3/08*
U.S. Cl. 74—473 R **16 Claims**

5. In a transmission including a housing, an input shaft journalled in said housing and defining an input gear, an output shaft journalled in said housing, a plurality of output gears

journalled on said output shaft, a cluster gear assembly journalled in said housing and defining a ratio input gear driven by said input gear and a plurality of ratio output gears respectively in driving relationship with said output gears, and a plurality of clutching elements supported by said output shaft and movable for selectively engaging said output gears with said output shaft to establish a plurality of drive ratios; the improvement comprising a plurality of shift forks respectively contacting said clutching elements for effecting movement thereof, each shift fork defining a bore portion, a plurality of bars formed from a harder material than said shift forks and respectively secured to said shift forks for movement there-



with, each bar defining a complementary bore portion whereby each associated shift fork and bar together define a bore, and shift means including a shift element movable in said bores and selectively engageable with said bars upon initial movement of said shift means, the engaged bar and its associated shift fork being movable to establish one of said drive ratios upon subsequent movement of said shift means.

6. The invention according to claim **5**, said shift means including a lock element engageable with the remainder of said bars upon said selective engagement of said shift element with one of said bars, said lock element preventing movement of the remainder of said bars upon subsequent movement of said shift means.

3,929,030

AUTOMOTIVE STEERING SYSTEM OF RACK AND PINION TYPE HAVING MEANS TO PREVENT DISPLACEMENT OF STEERING SHAFT IN COLLISION

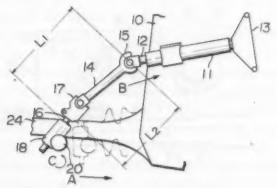
Kazumi Sukeshita, Koganei, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 3, 1974, Ser. No. 529,186

Claims priority, application Japan, Dec. 7, 1973, 48-139452[U]

Int. Cl.² B62D *1/18*

U.S. Cl. 74—492 **6 Claims**



1. In an automotive steering system having a rack-and-pinion type steering gear, the steering shaft being linked with the pinion shaft through a relay shaft, the relay shaft being coupled with the steering shaft by a flexible joint, the rack member being enclosed in a rack jacket tube integrated with the steering gear box and arranged generally laterally of the vehicle, the combination of (a) first means to clamp the rack jacket tube to a chassis member, said first means comprising two clamp regions of the outer surface of the rack jacket tube, said clamp regions being shaped circular-cylindrical and arranged at a distance therebetween, two clamp members fixed to the chassis member and shaped to rotatably receive said two clamp regions, respectively, and second means to fix the rack jacket tube to the clamp members in such a manner that the rack jacket tube is allowed to be turned on the axis thereof when an external force generally in the longitudinal direction of the vehicle and greater than a predetermined magnitude is exerted on the chassis member, and (b) third means to move the pinion shaft such that the distance between the gear box and the flexible joint is shortened without any substantial displacement of the steering shaft, when the rack jacket tube moves generally rearwardly of the vehicle and turns on the axis thereof.

3,929,031

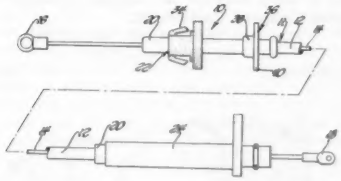
CLUTCH LOCK

Grant A. Webb, Northville, Mich., assignor to Teleflex Incorporated, North Wales, Pa.

Filed Feb. 4, 1974, Ser. No. 439,120

Int. Cl.² F16C *1/10*

U.S. Cl. 74—501 R **10 Claims**



1. A motion transmitting remote control assembly of the type for transmitting forces along a curved path by a motion transmitting core element, said assembly comprising: a flexible guide means, a flexible motion transmitting core element movably supported by said guide means with the ends thereof extending from the ends of said guide means, a support member, said support member normally slidably supporting said guide means when said support member is in supporting relationship to said guide means to permit axial movement of said guide means with respect to said support member, and locking means supported by said support member and engageable with said guide means for controlling the axial sliding movement of said guide means relative to said support member; said locking means including a plurality of resilient fingers supported circumferentially about said guide means and extending toward said guide means to establish gripping engagement therewith, said fingers contacting the surface of said guide means at an acute angle whereby said fingers allow relative movement between said guide means and said support member in one direction when a force sufficient to overcome the gripping engagement is applied to said guide means while normally preventing such movement in the opposite direction when said guide means is supported by said support means and said fingers engage said guide means.

3,929,032

TRANSMISSION ASSEMBLY

Paul H. Kehm, Ambler, Pa., assignor to Teleflex Incorporated, North Wales, Pa.

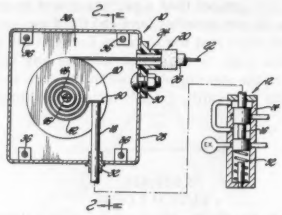
Division of Ser. No. 394,358, Sept. 4, 1973, Pat. No. 3,884,449. This application Jan. 6, 1975, Ser. No. 538,870

Int. Cl.² F16C *1/10*

U.S. Cl. 74—501 R **2 Claims**

1. An actuating assembly comprising: a member to be actuated, a motion transmitting remote control including guide means and a flexible motion transmitting core element mov-

ably supported by said guide means, and a flat flexible spring interconnecting said core element and said member for moving said member in response to movement of said core element.

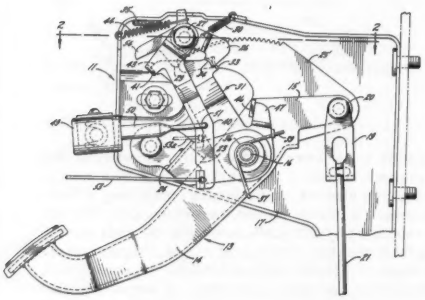


3,929,033

VEHICLE PARKING BRAKE CONTROL

Thomas O. Marx, Rockton, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Nov. 20, 1974, Ser. No. 525,365
Int. Cl.² G05G 1/04
U.S. Cl. 74—512 **10 Claims**



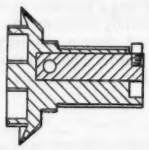
1. A vehicle parking brake control comprising a support, an actuator mounted on said support to move between release and apply positions, the movement of said actuator to said apply position being effective to set the vehicle parking brake, a member associated with said actuator and movable from a normal position to a hold position when said actuator is moved from said release position to said apply position, the vehicle parking brake being held in a set condition when said member is retained in said hold position and being released when said member is returned to said normal position, a latch movably mounted on said support and automatically engageable with said member to retain the member releasably in said hold position when the member is moved to such position, an impactor mounted on said support for movement between a cocked position in which the impactor is spaced from said latch and a striking position in which the impactor slams against said latch, means for releasably retaining said impactor in said cocked position when said member is in said hold position, and energy storing means associated with said impactor and positioned to be loaded as an incident to movement of said member from one of its positions to the other of its positions, said energy storing means being operable when loaded to bias said impactor away from said cocked position and toward said striking position whereby said impactor is propelled away from said cocked position upon being released by said retaining means and slams against said latch to release the latter from said member and permit the member to return to its normal position to release the vehicle parking brake.

3,929,034

ROTATING SYSTEM

Guido Marchione, 3 Via G. Leopardi, Trieste, Italy

Filed Apr. 29, 1974, Ser. No. 464,891
Int. Cl.² G05G 1/00, 3/00
U.S. Cl. 74—575 **1 Claim**



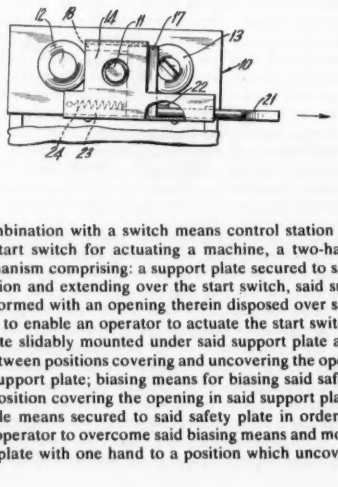
1. In an assembly of an axle, a first member rotatably journalled on said axle, and a second member rotatably journalled on said axle, the improvement which comprises, in combination, a first set of ratchet teeth projecting radially inwards on said first member, a second set of ratchet teeth projecting radially inward on said second member, said first and second sets of ratchet teeth being arranged for relatively opposite directions of drive and escapement about said axle, a pawl carrier housed in said axle, a first pawl on said carrier positioned in alignment with said first set of ratchet teeth, a second pawl on said carrier positioned in alignment with said second set of ratchet teeth, said second pawl being angularly offset from said first pawl, said pawl carrier being rotatable about an axis parallel to the axis of said axle into a first limiting position in which said first pawl projects from said axle and engages with a tooth of said first set of ratchet teeth whilst said second pawl is spaced from said second set of ratchet teeth, and a second limiting position in which said first pawl is spaced from said first set of ratchet teeth whilst said second pawl projects from said axle and engages with a tooth of said second set of ratchet teeth.

3,929,035

ELECTRIC CONTROL SAFETY MECHANISM

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, New York, N.Y.

Filed July 26, 1974, Ser. No. 492,139
Int. Cl.² F16P 3/00
U.S. Cl. 74—616 **11 Claims**



1. In combination with a switch means control station including a start switch for actuating a machine, a two-hand safety mechanism comprising: a support plate secured to said control station and extending over the start switch, said support plate formed with an opening therein disposed over said start switch to enable an operator to actuate the start switch; a safety plate slidably mounted under said support plate and movable between positions covering and uncovering the opening in the support plate; biasing means for biasing said safety plate to a position covering the opening in said support plate; and a handle means secured to said safety plate in order to enable the operator to overcome said biasing means and move said safety plate with one hand to a position which uncovers

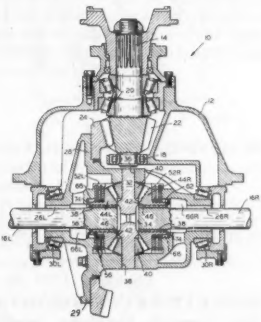
said start switch whereby said start switch may then be depressed with the other hand to activate the machine.

3,929,036

LIMITED SLIP DIFFERENTIAL WITH NEGLIGIBLE BIAS UNDER LIGHT LOAD CONDITIONS

Noah A. Shealy, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 26, 1973, Ser. No. 428,265
Int. Cl. F16h *1/44*; F16d *13/04*
U.S. Cl. 74—711 7 Claims



1. A limited slip differential mechanism comprising:
a. a differential carrier housing;
b. a cross disposed within said carrier housing and connected for rotation with the carrier housing;
c. an axle shaft rotatably carried by said carrier housing;
d. a planetary gear carried by said cross;
e. a side gear disposed within said carrier housing, and rotatable about the carrier housing axis of rotation, said side gear being disposed adjacent to said cross, with the teeth of said side gear engaging with the teeth of said planetary gear, with the inner end of said axle shaft being drivingly connected with said side gear;
f. friction clutch means for transmitting torque between the carrier housing and said side gear, said clutch means being disposed between an adjacent part of said carrier housing and an inner annular side surface of said side gear and including first friction means connected to the carrier housing and second friction means connected to said side gear whereby an axial force applied to said side gear, via said planetary gear, urges said clutch means first and second friction means into engagement and thus restrict the differential action of said mechanism; and
g. spring means capable of exerting a predetermined force, situated between a further adjacent part of said carrier housing and a first annular thrust side surface of said side gear adjacent to said spring means and axially spaced from said side gear inner annular end surface whereby said side gear is urged in a direction opposite to the direction of said axial force applied to said side gear via said planetary gear, thereby normally tending to urge said clutch means first and second friction means into disengagement as long as said predetermined force is greater than said axial force, thereby providing negligible bias to said axle shaft under light load conditions.

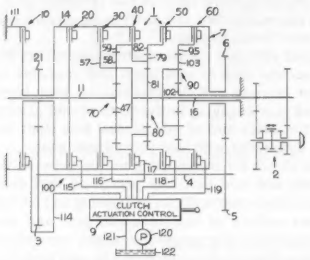
3. A limited slip differential mechanism comprising:
a. a differential carrier housing rotatable about an axis of rotation;
b. a cross disposed within the carrier housing and connected for rotation with the carrier housing, said cross having first and second opposite sides facing along the carrier housing axis;
c. first and second aligned axle shaft rotatably carried by said carrier housing;
d. a planetary gear carried by said cross;
e. a first side gear disposed within the carrier housing on said first side of said cross and rotatable about the carrier housing axis of rotation, the gear teeth of said first side gear engaging in the teeth of said planetary gear, with the inner end of said first axle shaft being drivingly connected with said first side gear;
f. a second side gear disposed within the carrier housing on said second side of said cross and rotatable about the carrier housing axis of rotation, the gear teeth of said second gear engaging in the teeth of said planetary gear, with the inner end of said second axle shaft being drivingly connected with said second side gear;
g. a first clutch for transmitting torque between the carrier housing and said first side gear, said first clutch being disposed between said carrier housing and an inner annular end surface of said first side gear and including a driving friction disc connected to the carrier housing and a driven friction disc connected to said first side gear;
h. a second clutch for transmitting torque between the carrier housing and said second side gear, said second clutch being disposed between said carrier housing and an inner annular end surface of said second side gear and including a driving friction disc connected to the carrier housing and a driven friction disc connected to said second side gear, whereby an axial force applied to one of said side gears urges its respective clutch friction discs into engagement to restrict the differential action of said mechanism; and
i. first spring means, exerting a first predetermined force, situated between said carrier housing and an adjacent thrust side surface of said first side gear axially spaced from said first side gear inner annular end surface, whereby said first side gear is urged in a direction opposite to the direction of said axial force applied to said first side gear, thereby urging said first clutch friction discs into disengagement when said predetermined force is greater than said axial force, thereby providing a negligible differential bias under light load conditions, said first clutch discs being urged into engagement when said axial force is greater than said predetermined force, thereby providing a high differential bias under heavy load conditions.

6. In a limited slip differential mechanism of the type having a cross disposed within a differential carrier housing and connected for rotation therewith about an axis of rotation, a planetary gear carried by the cross, an axle shaft rotatably carried by said carrier housing, a side gear disposed within the carrier housing and having its teeth engaged with the teeth of the planetary gear, with the inner end of said axle shaft being drivingly connected with said side gear, and friction clutch means for transmitting torque between the carrier housing and the side gear wherein the clutch means is disposed between an adjacent part of the carrier housing and an inner annular end surface of the side gear and includes a first friction means connected to the carrier housing and a second friction means connected to the side gear whereby an axial force applied to the side gear, via the planetary gear, urges the clutch means first and second friction means into engagement and thus restricts the differential action of the mechanism, wherein the improvement comprises biasing means, exerting a predetermined force, located between said carrier housing and an adjacent thrust side surface of said side gear axially spaced from said side gear inner annular side surface, whereby said side gear is urged in a direction opposite to the direction of said axial force applied to the side gear, via said planetary gear, thereby urging said clutch means first and second friction means into disengagement when said predetermined force is greater than said axial force, thereby providing a negligible differential bias under light load conditions.

3,929,037
SIX SPEED POWER SHIFT TRANSMISSION

James E. Marsch, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 30, 1974, Ser. No. 474,673
Int. Cl.[2] F16H 57/10, 37/06
U.S. Cl. 74—759 10 Claims



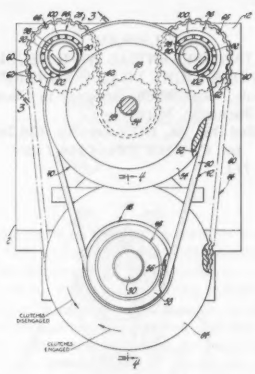
1. A vehicle transmission comprising, an input shaft and an output shaft rotatably mounted in a transmission casing and on a common axis of rotation, a front planetary gearset having a sun gear connected to said input shaft, an intermediate planetary gearset, a rear planetary gearset having a sun gear connected to said transmission casing, each of said planetary gearsets including a sun gear having an axis mounted on said common axis, each of said planetary gearsets including the elements of a sun gear, a ring gear, and a planetary carrier, means connecting the planetary carriers of said front planetary gearset and said rear planetary gearsets and the sun gear of said intermediate planetary gearset to said output shaft, means connecting the ring gear of the front planetary gearset and the planetary carrier of the intermediate planetary gearset, a front clutch housing and a rear clutch housing rotatably mounted on said common axis, a countershaft gearset rotatably mounted on a second axis parallel with said common axis including a drive gear on said front clutch housing, a driven gear on said rear clutch housing, and a countershaft having gears engaging said drive and driven gears of said clutch housings, a plurality of clutches connected to said front clutch housing, each clutch including a friction member singularly connected to at least one of said elements of said front planetary gearset, a plurality of clutches connected to said rear clutch housing, each of said clutches connected to said rear clutch housing including a friction member singularly connected to at least one of said ring gears of said intermediate planetary gearset and said rear planetary gearset, means selectively engaging said clutches to selectively provide power paths through said transmission.

3,929,038
GRINDING MACHINE AND DRIVE ASSEMBLY THEREFOR

Richard M. Moser, Lincoln Park, Mich., assignor to Moni, Inc., Livonia, Mich.

Filed Jan. 2, 1975, Ser. No. 537,888
Int. Cl.[2] F16H 5/52, 9/00, 3/14
U.S. Cl. 74—810 24 Claims

1. A grinding machine comprising: a rotatable grinding wheel; an output shaft drivingly connected with said grinding wheel; an input power shaft; and a drive mechanically including high and low speed drive trains extending between said input power shaft and said output shaft, said high speed drive train connecting the power shaft and the output shaft during rotation of the power shaft in one direction such that the grinding wheel is griven for high speed grinding, the high speed drive train uncoupling the power shaft and the output shaft during rotation of the power shaft in the other direction, said low speed drive train uncoupling the power and output shafts during rotation of the power shaft in the one direction, and the low speed drive train coupling said power and output

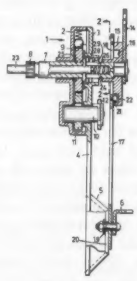


shafts during rotation of the power shaft in the other direction such that the grinding wheel is driven for low speed grinding.

3,929,039
SINGLE LEVER CONTROL DEVICE

Tore Erik Karl Comstedt, Stockholm, Sweden, assignor to Teknoflex Control System AB, Vastra Frolunda, Sweden

Filed May 7, 1974, Ser. No. 467,812
Claims priority, application Sweden, May 17, 1973, 7306990
Int. Cl. B60k 41/18
U.S. Cl. 74—878 4 Claims



1. Control device for performing two different operations by means of a single operating lever, preferably for control of the throttle and shifting gears in boat motors, comprising a main shaft rotatably journalled in a housing, on which the operating lever acts, a first control arm for the shifting operation which is effected by the rotation of the main shaft by means of a transmission means and a second control arm, connected to the main shaft, for the throttle opening, the transmission means being coupled to the main shaft via a coupling, which has a coupling shaft displaceably disposed in an axial bore in the main shaft, with at least one radially extending driver element, which extends through an axial slot in the main shaft and engages the transmission means in the position of engagement, spring means urging said driver element toward said position of engagement, the driver element in the neutral position of the main shaft lying opposite an opening in the housing or in a member connected to the

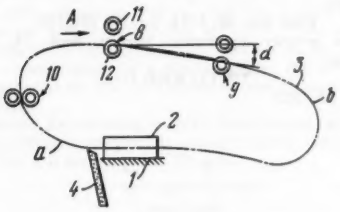
housing, through which opening the driver element at disengagement is pushed out through axial displacement of the coupling shaft against the effect of the spring means so that upon subsequent rotation of the main shaft the driver element slides against the side of the housing or the member connected to the housing, facing away from the transmission means, there being at least one stationary stop surface angularly displaced relative to and disposed immediately on at least one side of the opening and disposed on the side of the housing or the member connected to the housing and extending in the direction in which the driver element at disengagement is pushed, the coupling shaft being so disposed that when disengaged it is displaced by manual pressure so far that the driver element passes over the stop surface when the main shaft is rotated from the neutral position, and when the pressure on the coupling shaft is released and the main shaft rotated back toward the neutral position, the driver element engages the stop surface and prevents the rotation of the main shaft back to the neutral position until the driver element is again pushed and rotated to clear the stop surface.

3,929,040

BAND-SAW SHARPENING MACHINE

Vladimir Viktorovich Idel, ulitsa Gertseoa, 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.

Continuation of Ser. No. 425,836, Dec. 18, 1973, abandoned, which is a continuation of Ser. No. 300,362, Oct. 24, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,521
Claims priority, application U.S.S.R., Oct. 25, 1971, 1706659; Oct. 25, 1971, 1706660
Int. Cl.² B23D *63/12*
U.S. Cl. 76—37 **5 Claims**



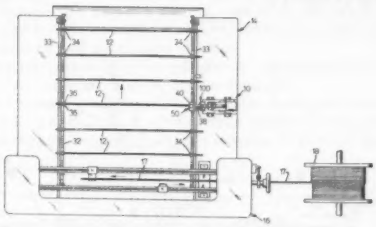
1. A machine for sharpening and setting the teeth of an endless band saw with its sides stretched in a horizontal plane, comprising: a bed; a cutting tool rigidly mounted on said bed; feeding means for feeding the saw with respect to said cutting tool, mounted on said bed; holding means for holding the saw on its lateral surfaces in the course of machining the teeth thereof, said holding means being mounted in said feeding means and having horizontal ways whereon rests one of the sides of the endless band saw; at least two supporting elements rigidly fixed on said bed for permitting the other side of the saw to rest thereon, said supporting elements being located at different heights from said bed, the first supporting element being nearest the horizontal plane of said bed and also being nearer to said feeding means than the distal portion of the band saw opposite the proximate portion of the band saw supported by said first supporting element whereby the length of the portion of the endless band saw between the feeding means and the supporting elements in the direction of the pitch feed of the sharpening and setting machine, is lesser in length than the length of the portion of the endless saw between said feeding means and said supporting elements in the direction opposite to the pitch feed of the sharpening and setting machine, so that the band saw is free to move under its own weight; and driving means for driving said cutting tool and said feeding means during an operation of the machine.

3,929,041

WIRE ALIGNING DEVICE FOR USE WITH A WIRE STRIPPING MACHINE

Gerald E. Blaha, Waukesha, Wis., assignor to Artos Engineering Company, New Berlin, Wis.

Filed Mar. 12, 1975, Ser. No. 557,619
Int. Cl.² H02G *1/12*
U.S. Cl. 81—9.51 **9 Claims**



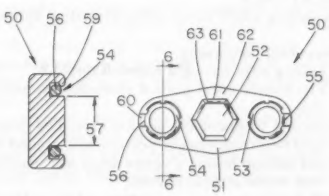
1. A wire guide assembly for use with a wire stripping machine having a stripping mechanism, said machine also having a wire conveying means including gripping means for releasably gripping a generally horizontally disposed insulated wire whereby said wire has a free end, said machine having a vertically movable clamp operable to engage said gripping means to rigidly secure said wire which is held between said gripping means, said assembly including a wire guide pivotably mounted to said wire stripping machine for swinging about a generally horizontal axis, pivotable linkage means connecting said vertically movable clamp with said wire guide, said wire guide including a notched member for receiving said free end, said guide being pivotal in response to vertical movement of said clamp such that said notched member pivots to embrace said wire for aligning said free end for reception by said stripping mechanism.

3,929,042

TOOL FOR INSTALLATION OF SEALS FOR LP GAS CYLINDER VALVES

William C. Blocker, 1406 N. Butler Ave., Indianapolis, Ind. 46218

Filed June 10, 1974, Ser. No. 478,049
Int. Cl.² B25B *13/06, 13/48*
U.S. Cl. 81—121 R **9 Claims**

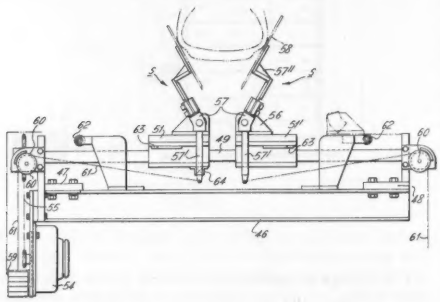


1. An O-ring storage wrench comprising:
a plate having a first hole extending therethrough for complementarily receiving a nut to be tightened;
at least one O-ring removably mounted on said plate;
said plate having means thereon operable to releasably hold said O-ring and to eccentrically locate said O-ring relative to said first hole.

3,929,043
METHOD AND APPARATUS FOR FINISHING PNEUMATIC TIRES

Seiichiro Nishimura, Tokyo, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Division of Ser. No. 257,531, May 30, 1972, Pat. No. 3,851,697. This application Sept. 24, 1974, Ser. No. 508,760
Claims priority, application Japan, June 7, 1971, 46-39277
Int. Cl.² B23B *3/00, 3/22;* B29H *21/08*
U.S. Cl. 82—1 C 4 Claims



1. A method of finishing pneumatic tires to trim molding spew pips and other fins from pneumatic tires rotating about their rotating axes which have been molded and vulcanized, comprising the steps of bringing cutting edges of comblike blades into slight contact with profiles in sectional planes parallel to the rotating axis in tangential direction to the profiles, said blades being mounted on swingable holders pivotally movable about axes intersecting planes including the rotating axis of the tire to be treated, and translationally moving the respective pivotal connections of said swingable holders in planes parallel to said sectional planes whereby guiding said cutting edges of said comblike blades so as to envelope said profiles of the tire.

3,929,044
CUTTING WHEELS FOR THE ISOSTATIC CUTTING OF PIECES, NOTABLY FROM TUBES

Jean Beauchet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

Filed Oct. 5, 1973, Ser. No. 403,957
Claims priority, application France, Oct. 16, 1972, 72.36542
Int. Cl.² B23B *5/14;* B26D *1/00;* B23D *21/06*
U.S. Cl. 82—46 A 4 Claims

1. A cutting wheel for an isostatic cutting device comprising:

a disc-wheel comprising:

a cutting edge having a rounded tip,

a first frustoconical portion extending inwardly from the tip,

a second frustoconical portion extending inwardly from said first frustoconical portion, said second frustoconical portion having a vertex angle less than that of said first frusto-conical portion,

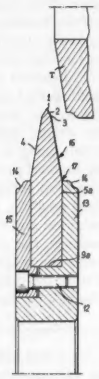
a fillet interconnecting said first and second frustoconical portions, and

a portion having parallel side surfaces extending inwardly from said second frustoconical portion, and

two supporting flanges,

said parallel-sided portion being clamped between said two supporting flanges,

one of said two flanges abuts the entire surface of one of the side surfaces of the parallel sided portion and the other one of said two flanges abuts the entire surface of the other side surface of the parallel-sided portion

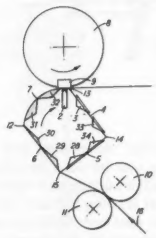


said supporting flanges form an operative portion of a tool operating by upsetting the metal around the cut formed by the cutting edge.

3,929,045
ARRANGEMENT FOR THE FEEDING AND CUTTING OFF OF A PACKING MATERIAL WEB

Jån Palsson, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden

Filed Aug. 26, 1974, Ser. No. 500,758
Claims priority, application Sweden, Sept. 14, 1973, 73125346
Int. Cl.² B26D *1/56*
U.S. Cl. 83—323 4 Claims

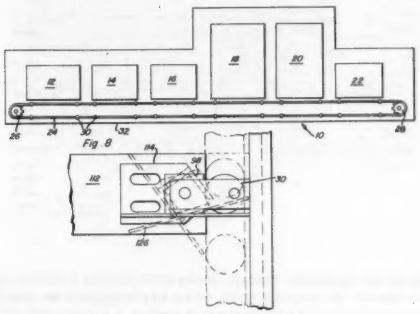


1. A device for continuously feeding and cutting off predetermined lengths of a continuous web of packaging material having spaced, parallel, transverse creases therein comprising a rotatable mandrel provided with a plurality of outer faces each being parallel to the axis of rotation of said mandrel and having parallel transverse edges for engaging the transverse creases of that portion of the web which is in engagement with at least one face of said rotatable mandrel for feeding said web, at least one transverse cutting means disposed in at least one face of said mandrel and spaced from the transverse edges of said at least one face, and at least one counterpressure plate rotatable in synchronism with said mandrel about an axis parallel with the axis of rotation of said mandrel so that said at least one counterpressure plate will cooperate with said at least one transverse cutting means to cut said web at predetermined locations along the length of the web after the web has been fed by said mandrel to the location of cooperation between said cutting means and said counterpressure plate.

3,929,046
PLATE CONVEYING APPARATUS

William C. Guenst, Jr., and Gerold Litschi, both of Ambler, Pa., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 456,841, April 1, 1974. This application May 2, 1975, Ser. No. 574,116
Int. Cl.² B26D 7/06
U.S. Cl. 83—409 1 Claim

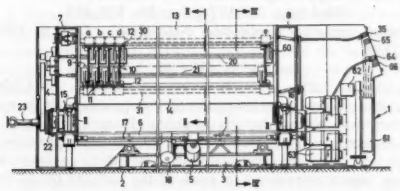


1. Plate conveying apparatus comprising:
1. a platform;
2. an endless chain adapted to be driven on the platform;
3. a plurality of anvils on the chain, each anvil having a vertical shaft with a constricted neck;
4. means to pull a plate over the top of at least two anvils;
5. staker means adapted to drive a staking pin down into the anvil shaft and to bring it up again;
6. plate unfastening means, including upward thrusting means arising from below the level of the anvil and adapted to unfasten the plate from the anvils;
7. a plate support of a size to support the entire plate, hinged at the rear, with means to raise the support at the front;
8. means for removing the plate from the grid; and
9. a cutting mechanism for cutting the plate into two pieces after it is removed from the grid.

3,929,047
LONGITUDINAL CUTTING AND/OR GROOVING MACHINE FOR MATERIAL WEBS IN MOTION, PARTICULARLY CARDBOARD MEANS

Hermann Josef Brandl, Mantel, Germany, assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Oct. 12, 1973, Ser. No. 405,911
Claims priority, application Germany, Oct. 13, 1972, 2250125
Int. Cl.² B26D 1/24, 5/02
U.S. Cl. 83—499 10 Claims



1. A longitudinal cutting and grooving machine for webs of material, particularly corrugated cardboard webs, comprising: a frame, a plurality of pairs of upper and lower rotating tools positioned on opposite sides of the web, guide means arranged transverse to the longitudinal direction of the web enabling to displace the tools along said guide means, a plurality of drives for the tools and adjustment drives for the displacement of the tools, an actual value counter, a set value indicator and comparing device therefor; means for positioning the pairs of tools, the actual value counters, the set value indicators, and the comparison means; each pair of tools including a pair of upper and lower adjustment spindles, an adjustment drive and means for connecting said adjustment spindles rigidly mechanically to said adjustment drive and the actual value counter; wherein in connections of the adjustment spindles with one another, with the adjustment drive and the actual value counter are disposed on the outside of the machine frame; and further including means for driving the upper and lower tools by said adjustment spindles,

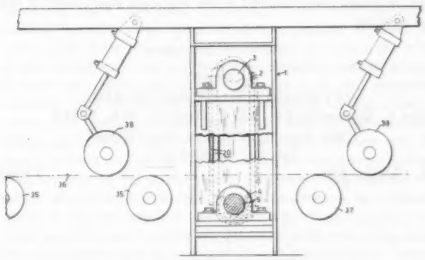
means for permanently coupling each adjustment spindle and its respective tool to one another, and

means including one common motor for driving the upper and lower adjustment spindles of an associated tool pair, wherein the motor is lockingly coupled to the two spindles.

3,929,048
RECIPROCATING GANG SAW

John W. McGehee, 3450 N. State St., Ukiah, Calif. 95482

Filed Nov. 11, 1974, Ser. No. 522,546
Int. Cl.² B27B 3/00
U.S. Cl. 83—751 4 Claims



1. In a gang saw that includes a row of elongated saw that includes a row of elongated saw blades in parallel, spaced relation having cutting teeth along one of their longitudinally extending edges, which teeth face the same direction for sawing engagement with the material to be cut thereby, the improvement comprising:

a. blade supporting means rotatable about parallel axes respectively extending along the opposite ends of said row rotatably connected with the ends of each of said blades at one of a plurality of points spaced from said respective axes and from each other for movement of said ends and said blades in annular paths in parallel planes with the ends of each blade offset from the others around said axes for successive sawing engagement of said blades with material fed thereto and therepast upon rotation of said blade supporting means in one direction,

b. means for supporting material to be cut to and past said cutting teeth during said rotation of said blade supporting means, and

c. power means connected with one of said blade supporting means for rotating it about its axis for successively moving the blades of said row into cutting engagement with material fed to and past said cutting teeth.

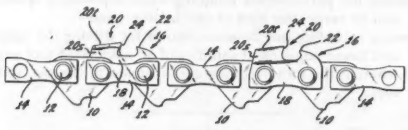
3,929,049
EXTENDED PITCH SAW CHAIN

Curtis L. Graversen, Milwaukie, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 398,143, Sept. 17, 1973, abandoned. This application Apr. 4, 1975, Ser. No. 565,150
Int. Cl.² B27B 33/14
U.S. Cl. 83—834 4 Claims

1. A saw chain comprised of pivotally connected center

drive links and guide bar engaging side links, certain of said guide bar engaging side links being cutting links, said cutting links having a base portion from which is extended a leading depth gauge portion and a cutting portion having a leading cutting edge, said base portion of said cutting links having front and rear rivet receiving openings with rivets therethrough pivotally connecting said cutting links to drive links that precede and follow said cutting links, said base portion further having front and rear bar engaging edge portions and said rear bar engaging edge portion providing at its rearward most point a pivot around which the cutting link pivots as the front end of the cutting link is raised in response to a force



acting against the cutting edge, said pivot being located rearwardly of the rear rivet opening and the lengthwise distance between said pivot and the front rivet being substantially greater than the vertical distance of the cutting edge above the pivot, and said pivot located at the rearward most point of the base portion.

3,929,050

REVERSIBLE HACK SAW BLADE

Arden L. Salzwedel, Rte. No. 1, Montello, Wis. 53949

Filed Aug. 1, 1974, Ser. No. 493,967

Int. Cl.² B23D *61/12*

U.S. Cl. 83—848 **1 Claim**

1. In a thin, elongated, narrow, toothed blade configured with apertures in near adjacency to the end extremities to provide for mounting in a frame, tensioning, stretching, and driving with reciprocal oscillation as a power hack saw to provide cutting action in one direction of motion, an improvement comprising in combination a first plurality of next adjacent teeth disposed in a file in one facing direction along one blade edge portion and second plurality of next adjacent teeth disposed in a file in opposite facing direction along another portion of said blade edge, wherein said portions are substantially equal in length and comprise substantially the entire blade edge, and wherein said files of teeth are aligned axially with each such tooth configured in substantial uniformity with all other teeth in such file, thereby to provide operable cutting reversibility to said blade.

3,929,051

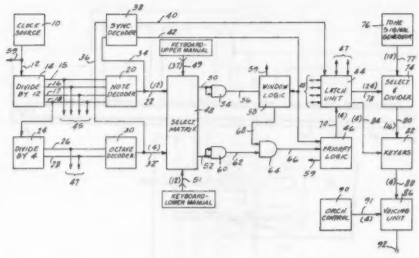
MULTIPLEX HARMONY GENERATOR

Douglas R. Moore, Niles, Ill., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.

Filed Oct. 23, 1973, Ser. No. 409,009

Int. Cl.² G10H *1/00, 3/06*

U.S. Cl. 84—1.17 **20 Claims**



1. In an electronic musical instrument having a source of tone signals, an output system, and a keyboard with an upper manual portion and a lower manual portion, a system comprising:

a. drive means for producing a plurality of signals for use in scanning the keys of the keyboard,

b. scanning means connected to said drive means for receiving said signals, and operative to scan the keys of the keyboard for producing first signals in response to operation of the keys of the upper manual and second signals responsive to operation of the keys of the lower manual,

c. means connected with said scanning means and responsive to said first signals and said second signals for producing third signals in accordance with the operated keys of the upper manual and of the lower manual only when keys of both the upper and lower manuals are simultaneously operated,

d. said third signals comprising a train of pulses encoded in time position in response to operated keys of both the upper manual and the lower manual, means synchronized with said scanning means and responsive to said third signals for producing a combination of output signals uniquely dependent on the time positions of pulses in said train of pulses, and

e. a plurality of keyers responsive to said output signals for keying selected ones of said tone signals to said output system.

3,929,052

ELECTRONIC MUSICAL INSTRUMENT WITH ONE TONE GENERATOR CONTROLLING A SECOND TONE GENERATOR

Davis Josephus van der Wal, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,633

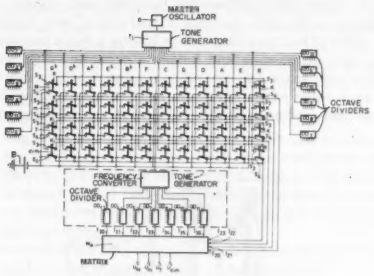
Claims priority, application Netherlands, Oct. 6, 1973, 7313758

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.22 **6 Claims**

1. Musical tone generating circuit comprising a single master oscillator, a first plurality of digital dividers connected to said master oscillator, each of said digital dividers providing a single tone output of a musical scale, a switching device means having inputs connected to each of the outputs of the first plurality of dividers and having an output for selectively providing one of said single tones as an output signal, a second plurality of digital dividers connected to the output of said switching device means for providing lower frequency musical output tones, a plurality of signal controlled adders each connected to a different combination of outputs of said second plurality of dividers, and means for selectively applying

control signals to said adders, whereby chords are selectively provided, and whereby the key of said chords from each of



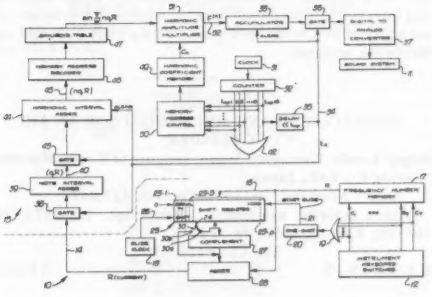
said adders is selectively transposed by operating said switching device means.

3,929,053

PRODUCTION OF GLIDE AND PORTAMENTO IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 29, 1974, Ser. No. 464,936
Int. Cl.² G10H *1/02, 5/00*
U.S. Cl. 84—1.24 **10 Claims**



1. Apparatus for producing glide or portamento in an electronic musical instrument of the type having a tone generator for generating a musical tone, and wherein the fundamental frequency of the generated tone is proportional to a number utilized by said tone generator, the value of said number that is presently utilized by said tone generator being the "current frequency number", said instrument comprising;

increment means for establishing another number that increases or decreases in value incrementally during the production of glide or portamento, said other number being a "fractional frequency number," and

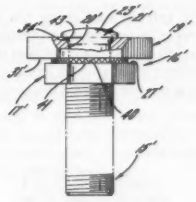
means for modifying said current frequency number in increments corresponding to said fractional frequency numbers, said modifying terminating when the modified current frequency number differs from the frequency number of the presently selected note by less than a certain amount.

3,929,054

FASTENING ELEMENT ADAPTED FOR TIGHTENING TO PREDETERMINED TORQUE

Charles E. Gutshall, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Dec. 1, 1972, Ser. No. 311,367
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 **13 Claims**



1. A fastening element adapted to be threaded into a workpiece to a predetermined torque by a tool, said element including an elongated threaded shank, and a head on one end of the shank comprising a base member integrally formed with the upper end of said shank, a projecting member extending upwardly from said base member, a plate member with a central opening telescoped on said projecting member and being shaped for engagement by said tool to tighten the screw in the workpiece, and permanently yieldable means adapted to hold said plate against turning relative to said projecting member until the tightening torque applied to said plate exceeds said predetermined torque and said means thereafter being permanently deformed so said plate member may slip freely around said projecting member, said means including a boss formed on the upper end of said projecting member and being spaced from said base member a distance substantially equal to the thickness of said plate, said boss engaging said plate member and holding the latter on said projecting member and against said base member, said means further including a first series of parts integrally formed of the material of said plate member, a second series of parts integrally formed of the material of another of said members, said first and second series of parts being oriented on their respective members to allow said plate member to be telescoped onto said projecting member with said parts in said first and second series interfitting with each other to hold said plate against turning relative to said projecting member until the tightening torque applied to said plate by the tool exceeds said predetermined torque, at least one of said boss and said interfitting parts being permanently deformed when said tightening torque exceeds said predetermined torque.

3,929,055

EXPLOSIVE CHARGE PISTOL

Charles A. Lewis, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1963, Ser. No. 272,809
Int. Cl.² F41C *3/00*
U.S. Cl. 89—1 M **10 Claims**

1. In an explosive charge pistol, an elongated casing having at least one opening and a booster inserted in one end thereof, a stab-initiated delay detonator means fixedly supported in said casing and located adjacent to said booster in aligned relationship therewith,

a rotatable shutter mounted in said casing between said delay detonator means and said booster,

explosive leads defining an explosive path through said shutter and carried by said shutter in such a manner that said leads are axially misaligned with the delay detonator means and booster when the shuttter is in the unarmed position thereby providing a safety means,

a first fluid filled normally expanded bellows supported in the other end of said casing,

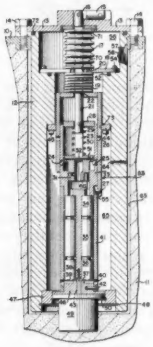
a second normally collapsed bellows supported within said casing,

a plate attached to said casing between said first and second bellows and having a vent therein for establishing communication between said first and second bellows,

spring loaded firing pin means connected to said second bellows,

detent means to release said firing pin means when said second bellows is in an expanded position,

means connected to said second bellows and said shutter to rotate said shutter to align said explosive leads with said delay detonator means and said booster when said second



bellows has expanded to complete an explosive train between said detonator means and said booster,

releasable means locking said first bellows in said expanded position whereby when said pistol is submerged in water and said releasable means is released the hydrostatic pressure of the water acts on the first bellows forcing said fluid through the vent in said plate to expand said second bellows, the expansion of said second bellows cocking said spring loaded firing pin means and rotating said shutter to align said explosive leads with said delay detonator means and said booster, said firing pin means being released when said second bellows reaches the expanded position thereby striking said delay detonator means to initiate sequential firing of the delay detonator means, explosive leads and booster.

3,929,056

STAPLER RELEASE SAFETY MECHANISM

Wilfried Lange, Altenhagen, Germany, assignor to Dieter Haubold Industrielle Nagelgerate, Brockhold, Germany

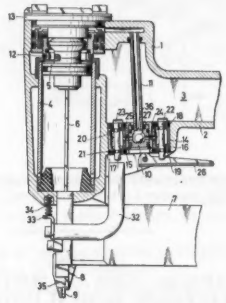
Filed May 14, 1973, Ser. No. 360,160

Claims priority, application Germany, May 17, 1972, 2224016

Int. Cl. F15b *11/08, 13/04*

U.S. Cl. 91—461 **1 Claim**

1. A release safety mechanism for a pneumatic stapler and nail driver, said mechanism comprising a casing having a compressed air reservoir and a separate working cylinder, an inlet valve in said cylinder, a piston movable in said cylinder in response to air pressure controlled by said inlet valve, a driving ram connected with said piston, a tube extending through said reservoir and having one end communicating with said inlet valve, said tube supplying compressed air to said inlet valve to keep it in a closed position, valve means connected with the other end of said tube, said valve means comprising a body carried by said casing and having a central chamber with an opening communicating with said other end of the tube and two passages spaced from and extending on opposite sides of said opening, a ball located in said chamber, said ball being movable to close any one of said passages in response to pressure differential between said passage and constituting with said chamber a ball valve, two auxiliary valves, each of said auxiliary valves having a space connected with a separate passage and having a separate valve piston located in said space and extending symmetrically to said ball valve, each valve piston having an end portion extending into said reservoir, and an opposite end portion extending to atmo-



sphere, two separate gasket rings carried by each valve piston to seal off the respective space alternately from the atmosphere and said reservoir, a separate stop carried by each valve piston upon its one end portion extending into said reservoir and adapted to engage said body to prevent excessive displacement of each valve piston, and separate trip means adapted to engage said opposite end portions to actuate said valve pistons, whereby compressed air keeps either of said inlet valve in the closed position when said trip means are not actuated and in the open position only when both said trip means are actuated.

3,929,057

HYDRAULIC BRAKE MECHANISM FOR AN AIR CYLINDER

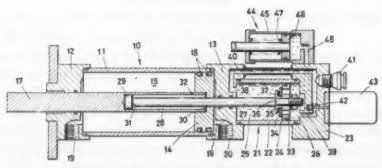
Shigeji Kondo, Gamagori, Japan, assignor to Kondo Manufacturing Co. Ltd., Japan

Filed Dec. 26, 1973, Ser. No. 427,847

Claims priority, application Japan, Sept. 18, 1973, 48-105140; Apr. 14, 1973, 48-42427

Int. Cl.² F15B *15/2*

U.S. Cl. 92—9 **4 Claims**



1. A feed mechanism for a machine tool comprising in combination:

a. a double-acting pneumatic cylinder assembly having a first piston and a piston rod having its inner end secured to and terminating within said piston, said rod having an axially hollow portion and an outer end for being connected to a load, said rod being subjected to compressional axial forces as it is extended during its working stroke and to tension during retraction thereof, there being means communicating the interior of said rod with

that side of said first piston which is the low pressure side during the working stroke and the high pressure side during retraction;

b. a double-acting hydraulic cylinder assembly connected concentrically with said pneumatic cylinder assembly, and having a second piston, of smaller diameter and lesser stroke than said first piston, and a second piston rod having one end rigidly secured to said second piston, said second piston rod having a portion at all times projecting through and slidably guided by said first piston into said hollow portion of said piston rod;

c. the other end of said second piston rod having a flange engaging the low-pressure side of said first piston during the working stroke to tension said second piston rod for thereby pressurizing the side of said second piston which is closer to said first piston, said flange being engaged by an abutment in said axially hollow piston rod during the return stroke;

d. impact absorbing means for acting between said flange of said second piston rod and said first piston;

e. a throttling passageway interconnecting the opposite sides of said second piston during a working stroke, there being a power-actuated shut-off valve in said throttling passageway for hydraulically arresting the second portion during the working stroke;

f. a separate second hydraulic cylinder assembly including a third piston of the single-acting spring-return type and fluidly connected to the end of the first-named hydraulic cylinder which is more remote from said first piston and disposed in radially spaced relation to said first hydraulic cylinder assembly; and

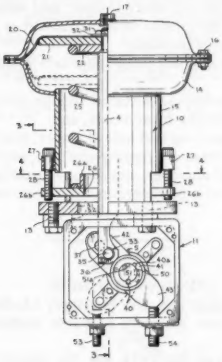
g. a check valve directed to freely interconnect the opposite sides of said second piston during a return stroke.

3,929,058

VALVE ACTUATOR

Joling P. Smith, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Oct. 15, 1973, Ser. No. 406,164
Int. Cl.[2] F16K *31/165*; F15B *15/06*; F16H *21/44*
U.S. Cl. 92—13 **9 Claims**



1. An actuator for converting linear motion to rotary motion comprising:

a. housing means;

b. force transfer means disposed in said housing means for movement from one terminal position in said housing means toward another;

c. means associated with said housing means for effecting movement of said force transfer means between said terminal positions in said housing;

d. a substantially rigid rod member connected to said force transfer means for reciprocal movement between first and second terminal positions during said travel of said force transfer means between its terminal positions; and

e. crank means connected to said rod member and rotatable about a fixed axis through an angle of a preselected value in response to said reciprocal movement of said rod member;

f. said rod member being selectively and pivotally connectable directly to said crank means at either of first and second pivot points on said crank means at positions radially spaced from said crank axis to change the angle of rotation of said crank means without altering the amount of said rod member reciprocal movement,

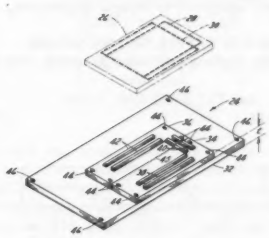
said actuator including means for shifting said rod member transversely to the axis of the path of travel of said force transfer means such that the axis of said rod member when connected at said first pivot point is substantially parallel to the axis of said rod member when connected at said second pivot point, when said force transfer means is at one of its terminal positions.

3,929,059

DIE COUNTER PLATE OR MAKE-READY FOR FORMING BOX BLANKS

Walter P. Gendron, 150 Fairview, Dollard des Ormeaux, Quebec, Canada

Filed June 5, 1974, Ser. No. 476,611
Int. Cl.[2] B31B *1/16*
U.S. Cl. 93—58.3 **6 Claims**



1. A counter plate for use in cutting and scoring board to form carton blanks or the like comprising a mounting plate, means for detachably securing said mounting plate on a press, a plurality of accurately ground hardened steel cutting plates less than 20 inches wide and 3/16 of an inch thick adapted to cooperate with knives on a male die to cut said board and means for securing said cutting plates in abutting relationship to said mounting plate thereby to form the cutting surface of said counter plate, said mounting plate being made of different material than said cutting plates.

3,929,060

VEHICLE LITTER COMPACTOR

Willie C. Burke, P. O. Box 799 Route 1, Groveland, Fla. 32736

Filed Nov. 4, 1974, Ser. No. 520,680
Int. Cl.[2] B30B *1/04*
U.S. Cl. 100—100 **7 Claims**

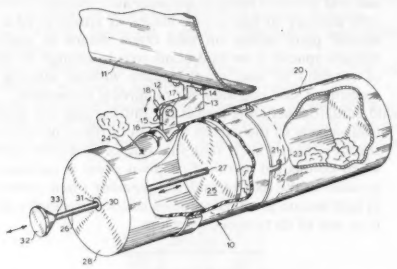
1. A vehicle litter compactor comprising in combination:

a. an elongated hollow casing;

b. said casing having an opening on one side thereof for the insertion of litter therein;

c. attaching means connected to said casing for attaching said casing to a vehicle, or the like, said attaching means having means for adjusting said casing to different positions, whereby said casing may be placed in one position when not in use and quickly shifted to a second position for use in compressing litter;

d. a slidable compression piston located in said hollow casing and slidable past said opening therein;
e. an elongated rod connected to said slidable piston and extending through said elongated casing for sliding said piston; and



f. a removable casing system removably attached to one end of said hollow casing whereby said piston will compress litter placed in said casing opening into said removable casing section which may be removed for disposal.

3,929,061

WATER EXTRACTION METHOD AND APPARATUS

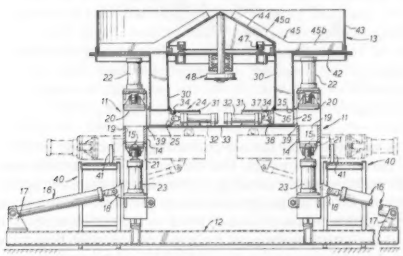
David Dugmore Banks, and Francis McManus, both of Blackburn, England, assignors to Scapa Engineering Limited, England

Filed Feb. 4, 1975, Ser. No. 547,059

Claims priority, application United Kingdom, Feb. 8, 1974, 5970/74

Int. Cl.² B30B *9/06, 15/32*

U.S. Cl. 100—116 **17 Claims**



1. A method of extracting water from pulp and of providing a pressed block of pulp including the steps of charging a generally vertically disposed press-chamber from above with moisture-containing pulp, constraining the pulp between opposed moisture-permeable elements arranged at the top and bottom of the said chamber, rotating the press-chamber from its generally vertical disposition into a generally horizontal disposition, pressing the pulp to extract moisture therefrom whilst the chamber is disposed horizontally, and ejecting the resultant pressed block from the chamber.

3. Apparatus for extracting water from pulp and of providing a pressed block of pulp, comprising a press-chamber, opposed moisture-permeable elements at respective opposite ends of the said chamber, at least one such element being movably mounted for adjustment relative to the other element to vary the separation of the elements for providing access to the chamber in the direction of movement of the element and for compressing material positioned between the said elements, and feed means adapted to introduce a predetermined quantity of moisture-containing material into the chamber for support by that moisture-permeable element arranged in opposed disposition relative to the aforementioned such element, the said press-chamber being movable between a first position wherein the opposed moisture-permeable elements are arranged in generally vertically spaced relationship, in which position the chamber is charged with moisture-containing material, and a second position wherein the said elements are in generally horizontally spaced relationship, in which position the pressed block is discharged from the chamber.

3,929,062

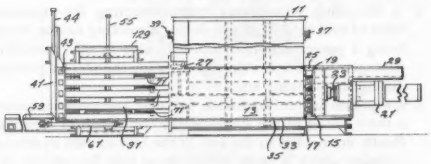
CLOSED CHAMBER BALER

Wallace M. Thompson, Cordele, Ga., assignor to Harris Press & Shear Corporation, Cordele, Ga.

Filed May 16, 1974, Ser. No. 470,572

Int. Cl.² B65B *13/20*

U.S. Cl. 100—3 **10 Claims**



1. In a closed chamber baler for forming compressible material into generally rectangular bales and including a hopper and a bale chamber in which said material is compressed and formed into bales, the method comprising the steps of:

feeding said compressible material into said hopper,

forcing said material from said hopper into said bale chamber, said forcing step including the step of reciprocating a ram with respect to said hopper and said chamber to force said compressible material from said hopper into said bale chamber,

guiding strapping wires about the external periphery of said bale chamber after a predetermined quantity of material has been forced into said chamber, said wires being positioned about the outside of said chamber at a plurality of vertically spaced intervals,

tensioning said strapping wires about said compressed material,

releasing said strapping wires to engage said compressed material to thereby form a bale, and

ejecting said bale from said bale chamber, said ejecting step including the steps of gripping said bale, moving said bale outside of said chamber, and releasing said bale after said bale has moved a predetermined distance outside of said chamber.

3,929,063

BINDING MACHINE

Nils Erik Stromberg, and Ulf Engelbert Lindberg, both of Sundsvall, Sweden, assignors to Sunds Aktiebolag, Sundsvall, Sweden

Filed Apr. 26, 1974, Ser. No. 464,675

Claims priority, application Sweden, May 10, 1973, 7306601

Int. Cl.² B65B *13/04*

U.S. Cl. 100—26 **8 Claims**

1. A binding machine for binding objects with wire, comprising

a device (**6**) for feeding and stretching the wire;

a track (**8**) for guiding the wire around an object to be bound;

a locking unit comprising a stop member (**29**) for the free wire end as well as a movable (**30**) and a stationary (**31**) tongs part for locking the free wire end;

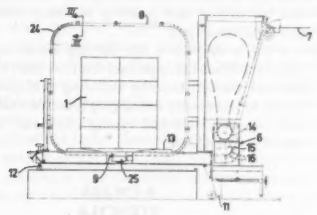
a twisting unit comprising a rotary twisting roller (**36**) in the form of a toothed wheel provided with a radial slit (**37**) for twisting the wire parts;

a cutting unit comprising a movable (**48**) and a stationary (**47**) cutting member for cutting off the wire;

a openable guide bar (**10**) for guiding the wire between the units;

lever means (**32**) for operating the movable tongs part (**30**); a lever member (**50**) for operating the movable cutting member (**48**);

lever means (**27***a*, **27***b*) for operating the openable guide bar (**10**); and



transmitting wheels (**39**) (**40**) for transmitting drive force to the twisting roller (**36**);

said locking unit, twisting unit, cutting unit, openable guide bar, lever means, lever member and transmitting wheels all being assembled in one binding unit (**9**), and

a drive unit (**25**) attached to the binding unit (**9**) for driving the parts assembled in said binding unit (**9**),

said binding machine being further characterized in that said lever means and said lever member and, respectively, the transmitting wheels are adapted to be driven only by frictional contact with drive means (**33, 34, 51, 52**), and, respectively, a drive wheel (**38**) in said drive unit (**25**).

3,929,064

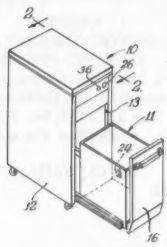
REFUSE COMPACTOR WITH RECEPTACLE CONTROLLED ACTUATION

Thomas R. MacFarlane, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 2, 1974, Ser. No. 430,175

Int. Cl.² B30B *15/14*

U.S. Cl. 100—53 **13 Claims**



1. A refuse compactor comprising: a receptacle defining a compacting space; means for movably mounting said receptacle for selective disposition in a refuse compacting position and in a refuse receiving position; ram means for compacting refuse in the receptacle; control means for causing sequential movement of the ram means from a retracted position, into compacting engagement with refuse in the receptacle in the compacting position, and back to the retracted position; and means responsive to movement of the receptacle from said refuse receiving position to said refuse compacting position for temporarily operating said ram to move a preselected small amount away from said retracted position and cause said control means to complete a said sequential movement of the ram means.

3,929,065

WEDGE PRESS FOR CONTINUOUS DEHYDRATION OF A WEB OF FIBROUS MATERIAL, SUCH AS FIBERBOARD, ESPECIALLY

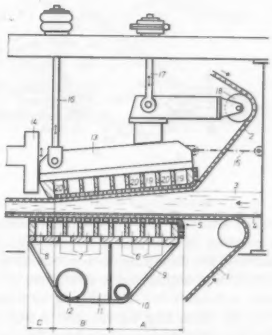
Elemer Csordas; Karl Gaugenmaier, both of Heidenheim, Brenz, and Gerhard Kotitschke, Steinheim, all of Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed May 7, 1974, Ser. No. 467,672

Claims priority, application Germany, May 10, 1973, 2323519

Int. Cl.² B30B *9/00*; **D21F** *1/44*, *1/00*

U.S. Cl. 100—90 **2 Claims**



1. Device for continuous dehydration of a previously formed web of fibrous material, such as fiberboard, containing moisture, comprising two pressure plates pervious to water and mutually disposed so as to form a wedge-shaped gap therebetween, the wedge angle of said gap and the mutual spacing of said pressure plates being adjustable, and a water-permeable belt looped around said pressure plates, respectively, one of said pressure plates having a terminating portion projecting beyond the other pressure plate at the narrow end of said wedge-shaped gap, suction chamber means located at least at said terminating projecting portion so as to apply suction to the web as the pressure exerted by the pressure plates on the web terminates for preventing rewetting of the web and additional suction means at a region of said one pressure plate immediately preceding said projecting portion in direction of feed of a web of fibrous material through said wedge-shaped gap from the wide to the narrow end thereof, said other pressure plate being formed with perforations.

3,929,066

MACHINE FOR PRINTING STAMPS, IN PARTICULAR ON BOTTLE CAPS

Marcel Octave Pillon, Gergy, France, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed Dec. 18, 1973, Ser. No. 425,891

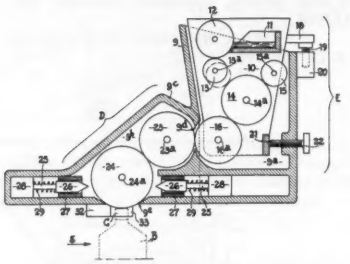
Claims priority, application France, Dec. 22, 1972, 72.46070

Int. Cl.² B41F *17/16*, *31/30*

U.S. Cl. 101—35 **15 Claims**

1. A machine for printing stamps on objects, comprising a device for printing the objects and a device for feeding the objects to the printing device, the printing device comprising a case defining a chamber which is closed except for a first opening and a second opening, a printing sub-assembly disposed in the chamber and comprising roller means defining a first surface for receiving ink and roller means defining a

second surface which is positioned for applying an ink stamp on each object through said first opening, a second sub-assembly which has roller means for inking up the first surface and is accessible and removable from the printing device, said first surface and said roller means of the second sub-assembly being in interengagement through said second opening, said first opening and second opening being just sufficient to allow application of the ink stamp on the object and inking of the first surface while rendering access to the inside of said chamber difficult, an electronic sub-assembly, means enclosing the electronic sub-assembly to render the electronic sub-assembly normally inaccessible, a device for detecting the passage of

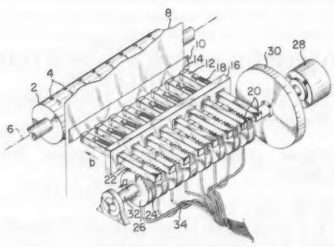


each object adjacent the printing sub-assembly to a position for the printing of the stamp on the object by the printing sub-assembly, the detecting device including a circuit producing an electrical signal upon detection of each object, the electronic sub-assembly comprising circuitry including the circuit of the detecting device and a counting circuit connected to the circuit of the detecting device to be responsive to the production of said signal, and a safety circuit associated with said circuitry to check correct operation of said circuitry upon passage of each object to said position for printing and operative to stop operation of the machine in the event of incorrect operation of said circuitry.

3,929,067
IMPACT PRINTER

Tatsuo Nishikawa, Tachikawa, and Osamu Asakura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 10, 1974, Ser. No. 487,370
Claims priority, application Japan, July 20, 1973, 48-82032; July 13, 1973, 48-83478[U]
Int. Cl.[2] B41J 9/32
U.S. Cl. 101—93.3 **16 Claims**

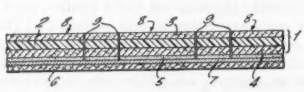


1. An impact printer comprising:
a type base carrying at least one group of typing characters, each of which being selectively faced toward printing paper;
a drive shaft having a driving force continuously applied thereto;
a friction disc mounted on said drive shaft corresponding to each said group of typing characters;
a wheel member disposed coaxially with and in facing relationship with respect to each said friction disc, said wheel member being rotatable relative to said friction disc;
an energizable magnet coil means for establishing, when energized, driving engagement between said wheel member and said friction disc by the magnetic force thereof, said magnetic coil being free from the rotation of said friction disc and said wheel member;
a printing hammer means for impacting a selected one of said typing characters through the recording paper;
means for urging said printing hammer means away from said type base; and
means for transmitting the driving force, applied to said wheel member through said friction disc, to said printing hammer means, thereby enabling said printing hammer means to overcome the urging force of said urging means and impact a selected typing character when said coil means is energized.

3,929,068
STENCILS

Brian Thomas Budden, Guildford, England, assignor to Samuel Jones & Company, Limited, England

Filed May 1, 1974, Ser. No. 466,013
Int. Cl.[2] B41N 1/24
U.S. Cl. 101—128.2 **1 Claim**

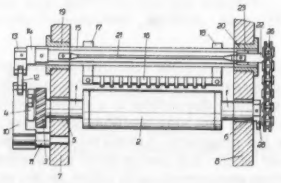


1. A stencil consisting of a first sheet in which a design is defined by cuts extending through the sheet, and a second sheet constituting a cover for the first sheet, the first and second sheets being bonded together by a coating of water-soluble pressure-sensitive adhesive on the first sheet, and the second sheet having a coating of silicone release material on its surface contacting the adhesive on the first sheet, permitting the first and second sheets to be peeled apart, the first sheet comprising a layer of polyethylene laminated between two layers of kraft paper.

3,929,069
GRIPPER CONTROL FOR SHEET-FED ROTARY PRINTING PRESSES

Hans-Georg Jahn, Wiesloch, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed May 23, 1973, Ser. No. 363,043
Claims priority, application Germany, May 23, 1972, 2224732
Int. Cl.[2] B65H 5/10
U.S. Cl. 101—232 **2 Claims**



1. Gripper control means for sheet-fed printing presses, comprising a shaft on which an impression cylinder is

mounted, oscillatably mounted gripper means for feeding sheets to the printing press, a cam mounted on said shaft, actuating means operatively connected between said cam and said gripper means to oscillate said gripper means by said cam and said actuating means upon rotation of said shaft, spring means connected to said actuating means to apply a spring force to the oscillating motion of said gripper means, and control means connected to said spring for controlling said spring force, said control means being connected to said shaft, wherein said gripper means includes a hollow shaft, said acutating means including a lever arrangement operable by said cam for oscillating said hollow shaft, and said spring means comprises a torsion spring extending in said hollow shaft, a bearing shaft member oscillatably mounted in said hollow shaft, said torsion spring having one end thereof attached to said bearing shaft member, said control means including a mechanical connection between said bearing shaft member and said impression cylinder shaft, said mechanical connection comprising a crank mounted on said shaft, a chain attached to said crank, an eccentric cam mounted on said bearing shaft member, said chain being attached to said cam at the curved segment of the latter closest to the axis of symmetry of said bearing shaft member, said chain being arranged on said cam in such a manner that the chain is wound on and off of said eccentric cam for each oscillation of said bearing shaft.

3,929,070

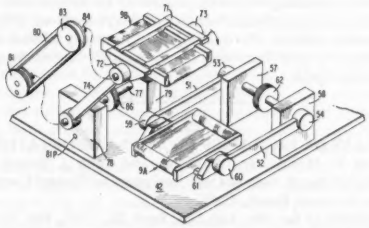
PRINTING METHOD AND APPARATUS WITH WIRE PRINTING ELEMENTS

John D. Grier, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 796,797, Feb. 5, 1969, abandoned. This application Dec. 15, 1971, Ser. No. 208,277

Int. Cl.² B41F *1/00*

U.S. Cl. 101—298 **6 Claims**



1. A method of forming a pattern of dots on a substrate comprising the steps of, supplying at least one elongated member with a printing media extending along its length, placing the said member into transverse and printing media transfer relationship with a plurality of coplanar members to transfer a portion of said printing media from said first member to said coplanar members, and then bringing said coplanar members into printing media transfer relationship with a substrate to transfer a pattern of dots thereto.

3,929,071

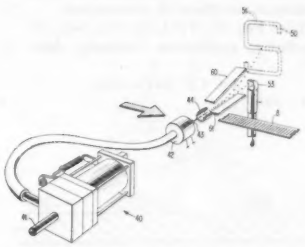
INK RECIRCULATING SYSTEM FOR INK JET PRINTING APPARATUS

David R. Cialone, Richmond; Gerald W. Hieronymus, Lexington; Henry R. Kruspe, Lexington; Richard W. McCornack, Lexington; Norwood K. Perkins, Lexington, and Donald L. West, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,774

Int. Cl.² G01D *15/18*

U.S. Cl. 101—335 **26 Claims**



1. Ink recirculating apparatus, comprising:

ink supply means, said ink supply means providing a predetermined quantity of ink for said apparatus;

a utilization device, said utilization device having an input side and an output side and intervening portions thereof open to atmospheric pressure;

an ink supply line interconnected between said ink supply means and the input side of said utilization device;

an ink return line interconnected between the output side of said utilization device and said ink supply means;

pump means interposed in said ink supply line for establishing a predetermined supply pressure to said utilization device and to concurrently establish a predetermined range of vacuum in said ink supply means; and

fluid servo means interposed in said ink return line to enable return of ink to said ink supply means while maintaining said predetermined range of vacuum in said ink supply means.

3,929,072

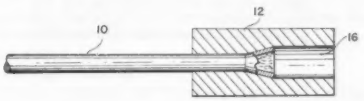
MILD DETONATING FUSE END TERMINATION

Donald C. Zapf, Ben Lomond, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 26, 1974, Ser. No. 527,325

Int. Cl.² C06C *5/08, 7/02*

U.S. Cl. 102—27 R **3 Claims**



1. A method of seating a mild detonating fuse within a metal ferrule having a small bore portion corresponding to the diameter of said fuse and linearly adjacent thereto and a coaxial enlarged bore portion with a diameter larger than the diameter of said fuse, said method comprising:

positioning said fuse within the bore portions of said ferrule so that the end of said fuse is located within said enlarged bore portion;

gripping said fuse to prevent axial movement;
applying axial forces to said end of said fuse to compress said fuse causing it to conform to the shape of said enlarged bore portion of said ferrule; and
machining said compressed end of said fuse to produce a flat clean surface.

3,929,073

COMPOSITE PRINTING PLATE

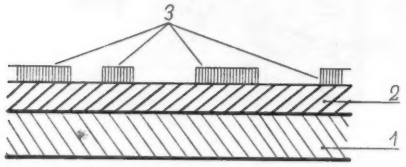
Klaus Bretthauer, Volkertshausen, and Erich Simon, Singen, Hohentw, both of Germany, assignors to Swiss Aluminum Ltd., Neuhausen am Rheinfall, Switzerland

Filed Feb. 27, 1974, Ser. No. 446,121

Claims priority, application Germany, Mar. 7, 1973, 7308584[U]

Int. Cl.² B41N *1/06*

U.S. Cl. 101—395 **2 Claims**



1. A printing plate formed of a composite material, comprising a support layer consisting of from 0.2 to 5 per cent manganese, from 0.1 to 0.5 per cent magnesium, zinc and tin at most as impurities, and the balance being aluminum and a clad layer consisting of from 0.2 to 10 per cent zinc and the balance being aluminum clad onto one side of said support layer.

3,929,074

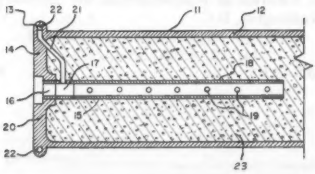
MEANS FOR THE ELIMINATION OF A CARTRIDGE RIM

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1974, Ser. No. 458,253

Int. Cl.² F42B *5/30*

U.S. Cl. 102—43 P **3 Claims**



1. A consumable cartridge comprising:
a case member;
a base member closing one end of the case member and encircled by a rim;
an igniter inserted through the base member into the interior of the cartridge; and
a fuse train and a pyrotechnic train in combination connecting the igniter and the base to insure consumption of the base and rim when the igniter is iniatiated.

3,929,075

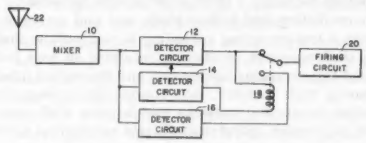
GUIDED MISSILE FUZE SYSTEM

Theodore E. Beane, Upper Gwynned Township, Montgomery County, and Alan L. Kirsch, Dresher, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1964, Ser. No. 347,098

Int. Cl.² F42C *13/04*

U.S. Cl. 102—70.2 P **1 Claim**



1. In a guided missile fuze system of the type wherein electromagnetic energy is radiated and a portion of said radiated energy is returned by a reflecting means for actuating a firing circuit the combination for providing countermeasures against a sweep jammer comprising:
a. first fuzing channel responsive to signals received in a first frequency band,
b. a first firing circuit,
c. a normally closed relay for connecting said first fuzing channel to said first firing circuit,
d. a second fuzing channel responsive to signals received in a second frequency band that is higher in frequency than said first frequency band,
e. a second firing circuit,
f. a normally open relay for connecting said second fuzing channel to said second firing circuit,
g. a signal processing channel responsive to signals received in a third frequency band that is higher in frequency than said second frequency band,
h. relay actuating means responsive to an output from said signal processing channel when signals are received from the sweep jammer for closing said normally open relay for a predetermined period that is less than the time for the sweep to travel from said signal processing channel to said second fuzing channel,
i. relay actuating means responsive to an output from said second fuzing channel when signals are received from the sweep jammer for opening said normally closed relay whereby said first firing circuit will not fire on the jamming signal.

3,929,076

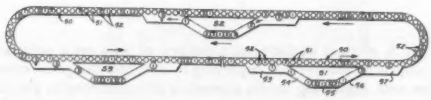
MEANS OF HIGH MASS FLOW TRANSPORTATION

William V. McRae, Jr., Anaheim, and John J. Stuart, Jr., Newport Beach, both of Calif., assignors to Transyt Corporation, Newport Beach, Calif.

Division of Ser. No. 185,126, Sept. 30, 1971, Pat. No. 3,769,913, which is a continuation of Ser. No. 765,550, Oct. 7, 1968, abandoned. This application Sept. 7, 1973, Ser. No. 395,243

Int. Cl.³ A63G *1/00*

U.S. Cl. 104—25 **19 Claims**



1. A transportation system, comprising:
a. a series of stations, each including means for receiving cars and means for delivering cars;
b. a continuously movable loop connecting the stations in sequential order, the loop including a plurality of car

receiving locations divided into sets, the number of sets corresponding in number to the stations, and the locations constituting each set being reserved only for cars destined for a selected station;

c. a multiplicity of cars for removable reception at said locations and at said stations, the cars being divided into sets corresponding in number and sequence to the number and sequence of the stations, the cars of each set being destined for delivery only to a single selected station and received only at the corresponding set of locations;

d. said cars, when received in any station, being reassignable to other sets for delivery to corresponding sets of locations.

3,929,077

CONVEYOR SYSTEMS

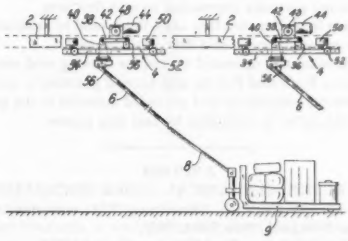
Lars Olov Benndahl, Vidtskuegaard, Aaby Ringvej, 8230 Aabyhoj, Denmark

Filed May 30, 1974, Ser. No. 474,793

Claims priority, application United Kingdom, May 30, 1973, 25696/73

Int. Cl.² B61B *5/00*; B60M *1/34*

U.S. Cl. 104—93 **24 Claims**



1. A conveyor system of the type comprising an overhead guiding rail supporting a number of driving units each provided with a driving motor so as to be movable along the rail and with means for holding one end of a depending pulling rod operable to be connected with a load carrier for driving the carrier along the path of the rail, each of said driving units being provided with at least one driving wheel connected with said motor and frictionally engaging a first surface portion of the rail, the rail having a second surface portion opposed to said first surface portion, each driving unit further being provided with at least one counter pressure wheel engaging said second surface portion of the rail, clamping means being provided for urging the driving wheel and the counter pressure wheel in opposite directions against the respective surface portions of the rail, characterized in that the pulling rod holding means are operatively connected with said clamping means so as to effect an increase of the clamping force of said wheels against the opposed rail portions in response to the pulling force in said pulling rod exerting an increased resistance against the movement of the driving unit.

3,929,078

DROP FINGER CONVEYOR, HANGER AND METHOD

Richard J. Sears, P.O. Box 83, Elk Grove Village, Ill. 60007

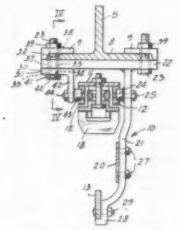
Filed June 3, 1974, Ser. No. 475,954

Int. Cl.² E01B *25/24*

U.S. Cl. 104—111 **15 Claims**

1. In a drop finger conveyor assembly including a supporting beam, a drop finger conveyor chain disposed to run longitudinally in limited spaced relation below the beam, horizontally spaced longitudinally extending track means supporting and guiding the conveyor chain, therebetween, a longitudinal track rail substantially spaced below the chain and the track means, and means for attaching a hanger to said beam, the improvement comprising:

a hanger having a track rail supporting leg depending from one end portion of a horizontal head plate thinner than the width of the space between the beam and the chain and track means and extending across and under the beam and secured thereto by said attaching means, an opposite end portion of the head plate being free from any obstruction which would interfere with moving said opposite end of the plate into position under the beam by passing it freely through the space between the beam and said chain and track means;



means securing the rail to a lower portion of said leg;

means on an upper portion of said leg mounting the chain guiding track means at one side of the conveyor chain;

a bracket provided separate from said plate and mounting the chain guiding track means at the opposite side of the chain;

and securing means fastening the bracket to said opposite end portion of the head plate; whereby the hanger is adapted to be installed by inserting said head plate into position between said beam and the conveyor chain and then attached to the beam without dismantling the chain or the guiding means, and the bracket is adapted to be thereafter secured in place on the installed head plate and in mounting relation to the chain guiding means.

3,929,079

TRANSPORT SYSTEM

Gunnar Thure Eliassen, Skolgatan 1, S-661 00 Saffle, Sweden

Continuation of Ser. No. 248,494, April 28, 1972, abandoned. This application June 17, 1974, Ser. No. 480,101

Claims priority, application Sweden, Apr. 30, 1971, 5634/71

Int. Cl.² B65G *13/12*; B61B *13/00*; B60S *13/02*

U.S. Cl. 104—172 B **3 Claims**

1. A system for transporting, comprising:

a. a guideway including

at least one pair of horizontally spaced parallel tracks; and a rollway having rollers intersecting said tracks from a position lower than said tracks to a position higher than said tracks; and

b. a carriage including

wheels for engaging said track to allow said carriage to advance along said tracks;

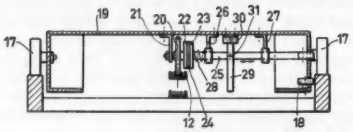
a planar portion extending parallel to the rotational axes of said wheels in a plane beneath said wheels, said planar portion having a width less than the space between the parallel tracks and being engaged by the rollers to lift the carriage from said tracks so that the carriage may roll along the rollway at an angle to said tracks,

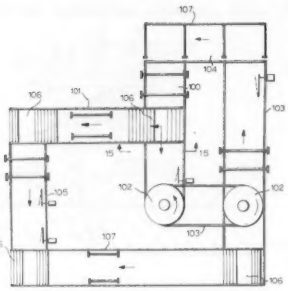
a chain positioned between said tracks for conveying said carriage therealong;

sprocket means on said carriage for engaging said chain;

uncoupling means for disengaging said sprocket from said

chain; and





said sprocket means and said uncoupling means being positioned above said planar portion so as not to engage said rollway.

3,929,080

CULTIVATING AND PARTICLED MATERIAL APPLYING GARDENING TOOL

Swan M. Akeyson, 726 Walnut, Long Beach, Calif. 90813

Filed Aug. 26, 1974, Ser. No. 500,290
Int. Cl.² A01C *7/08*
U.S. Cl. 111—1 **3 Claims**

1. A soil cultivating and particled material applying device that includes:

a. an elongate shaft having first and second ends;

b. tine means projecting from said first end of said shaft;

c. a hopper secured to said shaft adjacent said first end thereof, said hopper having first and second open ends, said hopper capable of having said particled material positioned therein through said first open end, and said particled material discharging by gravity through said open end;

d. a cylindrical housing in communication with said second open end, said housing secured in a fixed position relative to said shaft, with said housing having a particled material discharge opening therein adjacent said tine means and said housing including two spaced end pieces;

e. rotatable metering means in said housing, said metering means when in a first position receiving and holding a metered quantity of said particled material from said hopper through said second end thereof, and said metering means when pivoted to a second position discharging said metered quantity of said particled material by gravity through said discharge opening to fall to the ground surface said rotatable metering means including;

1. a rod of circular transverse cross section journalled in said end pieces and extending therebetween, said rod having first and second arms extending outwardly from opposite ends thereof; and

2. at least a portion of a cylindrical shell in said housing rigidly secured to said rod, said shell having a metering chamber therein that receives said granular material from said hopper when aligned with said second end thereof, with said chamber discharging said granular material through said discharge opening when aligned with the latter, and said manually operated means being pivotally connected to said first arm.

f. spring loaded means that at all times tend to maintain said metering means in said first position; and

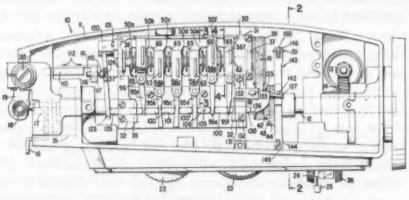
g. first manually operated means for moving said metering means from said first to said second position to permit a metered quantity of said particled material to the ground as the latter is cultivated by said tine means.

3,929,081

ELECTRO MECHANICAL ADDER MECHANISM

Stanley Joseph Ketterer, Jamesburg, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,727
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 D **4 Claims**



3. In a sewing machine having a frame, a needle bar gate supported in said frame for lateral oscillation, a needle bar supported in said gate for endwise reciprocation, drive means including means to drive said needle bar in endwise reciprocation, and means for driving said needle bar gate in lateral oscillation said means including:

An adder mechanism having a housing supported in said sewing machine frame, a drive shaft journaled in said housing driven by said sewing machine drive means, a plurality of adder links carried by said housing spaced from said drive shaft, said adder links each having a thin section and a thick section, a plurality of link actuators individually connected to said adder links encircling said drive shaft and spanning said space between said drive shaft and said adder links, adder spacers interposed between said adder links and carried in said housing in a selected effective position for connecting selected sections, means associated with said drive shaft and said link actuators for urging said link actuators and said adder

links to a selected position for said thin and thick sections of said adder links, and output means responsive to the total dimension of said adder spacers and said sections in said selected effective position for driving said needle bar gate in lateral oscillation.

3,929,082

NEEDLES FOR TUFTING OR THE LIKE

Josef Zocher, Haaren, Aachen, Germany, assignor to The Singer Company, New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 569,323
Int. Cl.² D05B *85/00*
U.S. Cl. 112—222 9 Claims

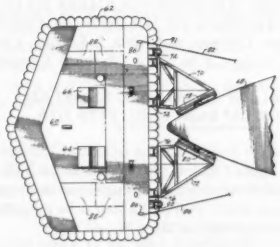
1. A needle for tufting or the like including a shank having a longitudinal axis, a blade extending from said shank, an eye and point portion including a transverse eye connected to said blade and terminating in a tip, said blade having a longitudinal groove on one side terminating at the eye, said eye and point portion having an axis skewed relative to said longitudinal axis away from said groove side, and means defining a shoulder at the junction of the eye and point portion with the blade on the side toward which the axis is skewed to define a clearance above the eye.

3,929,083

APPARATUS FOR CLEARING A PATH THROUGH ICE

Owen Davis Blankenship, and Edward Olen Anders, both of Houston, Tex., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Oct. 10, 1972, Ser. No. 295,803
Int. Cl.² B63B *35/08*
U.S. Cl. 114—40 14 Claims



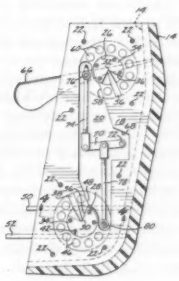
14. Ice breaking apparatus for use with a vessel having a buoyant hull, a deck and a prow extending therefrom comprising: a surface effect structure mounted on and attached to the prow and extending in front of the vessel and including a platform with a large areal extent having a flexible material attached to and extending downwardly from the platform to a point adjacent a surface being traversed by the vessel, such flexible material extending downwardly substantially around the underside of the platform to enclose the underside periphery of the platform, said surface effect structure having means mounted in the platform for forcing air below the platform.

3,929,084

HEIGHT CONTROL SYSTEM FOR A HYDROFOIL WATERCRAFT

David J. Cline, Brea, Calif., assignor to Dynafoil, Inc., Newport Beach, Calif.

Filed Feb. 14, 1974, Ser. No. 442,613
Int. Cl.² B63B *1/28*
U.S. Cl. 114—66.5 H 5 Claims



1. A height control system for a hydrofoil watercraft, said system comprising:

supporting strut means including a fin extending fore-and-aft and generally downwardly from the watercraft hull;

control hydrofoil means adapted to ride at or above the water surface and pivotally mounted to said fin in symmetrical relation thereto for pivotal movement about a transverse control axis, and having a center of lift and a center of gravity located rearwardly of said control axis;

lift hydrofoil means mounted to said strut means below said control hydrofoil means for pivotal movement about a transverse lift axis, said lift hydrofoil means having a center of lift located rearwardly of said transverse lift axis; and

linkage means coupling said control hydrofoil means and said lift hydrofoil means and operative upon pivotal movement of said control hydrofoil means to oppositely pivot said lift hydrofoil means, said linkage means including a pivot arm located between said control axis and said lift axis and pivoted at one extremity to said strut means; an upper actuating arm pivotally connected at its lower extremity to the extremity of said pivot arm opposite said one extremity, and pivotally connected at its upper extremity to said control hydrofoil means rearwardly of said control axis; and a lower actuating arm pivotally connected at its upper extremity to said pivot arm between the extremities thereof, and at its lower extremity to said lift hydrofoil means forwardly of said lift axis.

3,929,085

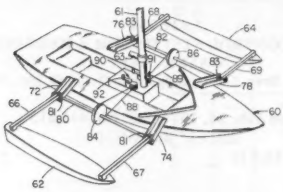
TRIMARAN

Scott M. Mason, P.O. Box 369, Wakefield, R.I. 02880

Continuation-in-part of Ser. No. 397,969, Sept. 17, 1973, Pat. No. 3,881,440, which is a continuation-in-part of Ser. No. 183,357, Sept. 24, 1971, abandoned. This application Nov. 4, 1974, Ser. No. 520,365

Int. Cl.² B63B *43/14*

U.S. Cl. 114—123 **14 Claims**



1. In a trimaran having one central and two outrigger hulls, each outrigger being connected to the central hull by a pair of mutually spaced arms which are resiliently pivoted to the central hull to permit the central hull to heel to the wind with respect to the outrigger hulls in the manner of a single hull sailing vessel, the improvement wherein

there are provided adjusting means operatively connected to each of said pairs of arms forcibly lower at least the leeward outrigger hull thereby to increase the bouyancy force exerted thereby and correspondingly to adjust its stabilizing effect on the central hull and means for pivotally raising said outrigger hulls out of the water, and

wherein each of said pairs of arms is mounted to pivot with a rod extending parallel to a side of the central hull and resilient means are provided acting between each rod and the central hull to permit gross movements of said outrigger hulls with respect to said central hull.

3,929,086

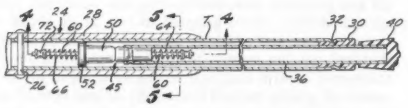
SAILBOAT TILLER APPARATUS

Hobart L. Alter, Capistrano Beach, Calif., assignor to Coast Catamaran Corporation, San Juan Capistrano, Calif.

Filed Feb. 1, 1974, Ser. No. 438,785

Int. Cl.² B63H *25/06*

U.S. Cl. 114—144 R **1 Claim**



1. Sailboat rudder apparatus, comprising:

a rudder;

a tiller tube attached to said rudder and normally extending forwardly therefrom;

a hiking stick telescopically arranged relative to said tiller tube;

a slider longitudinally slidably disposed within said tiller tube;

a flexible element connecting said slider and the rear end of said hiking stick, said flexible element being coaxial with said slider and said hiking stick and extending rearwardly from said slider and forwardly from the rear end of said hiking stick;

first spring means interposed between the rear end of said flexible element and said slider; and

second spring means interposed between the front end of said flexible element and the rear end of said hiking stick whereby said hiking stick is movable longitudinally between a retracted and an extended position relative to said tiller tube, and with said hiking stick being allowed to swivel relative to the front end of said tiller tube when said hiking stick is in its extended position.

3,929,087

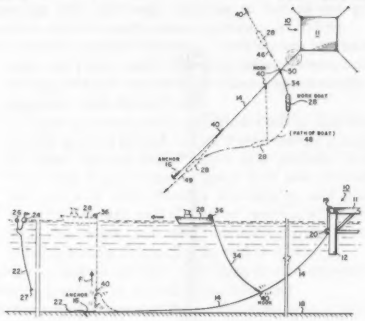
METHOD OF RETRIEVING ANCHORS

Thomas M. Montgomery, Aberdeen, S.C., assignor to Ocean Drilling & Exploration Company, New Orleans, La.

Filed Nov. 11, 1974, Ser. No. 522,395

Int. Cl.² B63B *21/26*

U.S. Cl. 114—206 R **5 Claims**



1. A method for locating and retrieving an anchor from the seabed and being attached to the lower end of an inclined mooring line which is considerably longer than the depth of the water body, the upper end of the mooring line being attached to a member of a floating marine structure, comprising the steps of:

attaching to one portion of a long service line a hook having an open gap;

submerging the hook in the water;

towing a remote portion of the service line in a direction intersecting the inclined mooring line, the length between said portions of the service line being such as to allow the submerged hook to catch the mooring line at a point considerably remote from said structure;

gradually swerving the service line in the direction of the mooring line toward the buried anchor while maintaining sufficient tension on the service line and maintaining the hook in engagement with the mooring line as the hook slides down on the mooring line; and

exerting an uplift force on the service line sufficient to retrieve the anchor.

3,929,088

USE OF WATER-IN-OIL EMULSIONS OF WATER SOLUBLE VINYL ADDITION POLYMERS TO IMPROVE THE EFFICIENCY OF JET POWERED SHIPS

Paul L. DuBrow, Chicago, and Alvin J. Frisque, La Grange, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 11, 1974, Ser. No. 487,524

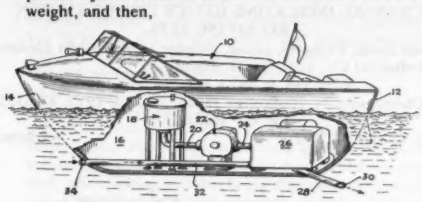
Int. Cl.³ B63H *11/02*; F17D *1/16*

U.S. Cl. 115—14 **4 Claims**

1. A method for improving the operating efficiency of an aqueous jet propelled ship of the type where a high pressure jet of water is forced outward through one or more orifices below the normal water level of the ship to be propelled which improvement comprises the steps of:

A. adding to the high pressure jet of water being forced outward before it leaves the ship, a quantity of water-in-oil emulsion of a finely divided water soluble vinyl addition polymer so that the polymer is present in the high

pressure jet of water at levels of from 0.003% to 10% by weight, and then,



B. forcing said high pressure jet of water through said orifice to produce a high pressure jet of water with improved coherent character and turbulence reduction properties whereby said aqueous jet propelled ship is operated more efficiently.

3,929,089

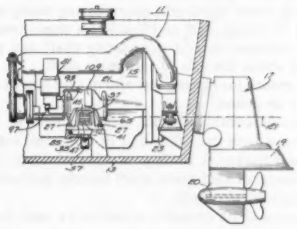
STERN DRIVE HYDRAULIC TRIM CONTROL SYSTEM INCLUDING A TILT POSITION INDICATOR

Ralph E. Lambrecht, Lake Bluff, and Harry Najimian, Jr., Lake Forest, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 18, 1974, Ser. No. 524,400

Int. Cl.² B63H *5/12*

U.S. Cl. 115—41 HT **7 Claims**



1. A stern drive unit comprising an engine, a stern drive leg fixed to the rear of said engine and including a part which is tiltable vertically and swingable horizontally independently of said engine, elastomeric mounting means connected to said stern drive unit rearwardly of the front of said engine and adapted for connection to a boat hull for vibrationally isolating and supporting said stern drive unit from the boat hull and for providing a pivotal axis relative to which said stern drive unit is tiltable relative to the boat hull, and means located forwardly of said elastomeric mounting means for tilting said stern drive unit about said elastomeric mounting means and for vibrationally isolating and supporting said stern drive unit from the boat hull, said isolating, supporting and tilting means comprising a mount including an elastomeric part, a bracket fixed to said elastomeric part and adapted to be fixed to the boat hull, an arm fixed to said elastomeric part remotely from said bracket, and a jacking mechanism connected between said engine and said arm for tilting said stern drive unit relative to the boat hull.

3,929,090

LEAKAGE WARNING DEVICE FOR VEHICLE TIRE

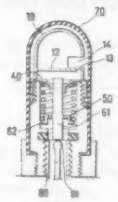
Chiang-Shui Su, No. 237 Ming Kuo Road, Chia-Yi, China /Taiwan

Filed Nov. 21, 1974, Ser. No. 525,879

Int. Cl.² B60C *23/02*

U.S. Cl. 116—34 R **2 Claims**

1. An air leakage warning device for a pneumatic tire comprising: a substantially cylindrical whistle-producing member having an enlarged shoulder on the lower portion thereof; a cylinder member containing piston means, a coil spring surrounding the same and responsive to a predetermined pressure within the tire, a perforated disk plate covering the upper end thereof, a perforated shoulder carried by said piston and retaining said coil spring between the same and said disk plate, the upper end of the cylinder member being inter-connected with the shoulder portion of the whistle-producing member and said perforated disk plate, and the lower end thereof having internal threads adapted to be screwed onto a conventional air filling valve stem of the tire; a rubber sack enveloping the whistle-producing member and the cylinder member



and forming a receiver for escaping air from the tire and adapted to be ruptured by air pressure so as to emit an audible signal, said rubber sack having an inwardly directed annular rim integrally formed on the circumference of the sack opening; a base member including a recess and an internal thread adapted to be screwed onto the lower exterior end of the cylinder member with said rim and the lower end of said rubber sack sandwiched therebetween, thereby tightly securing the rubber sack to the cylinder member; the whistle-producing member being provided with a radially extending plate on the inside of said whistle member and an air outlet port formed on the wall of said whistle member.

3,929,091

AUTOMATICALLY INFLATING AND LIBERATING A BALLOON

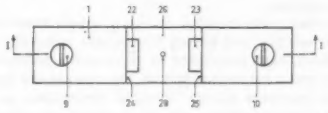
Philippe Holder, Avoriaz (Haute Savoie), France

Filed Apr. 8, 1974, Ser. No. 458,501

Claims priority, application France, Apr. 10, 1973, 73.12859

Int. Cl.² G09F *9/00*

U.S. Cl. 116—124 B **3 Claims**



1. A device for drawing attention to persons in danger comprising:

a. a source of gas under pressure;

b. a balloon means maintained in place in a housing and designed to be inflated by means selectively controlling the release of said source of gas; and

c. integral connecting means for removably interlocking said balloon means to said source of gas including two opposing members subjected to the action of resilient means, said action of said resilient means opposing the pressure of said gas upon release of said gas by said controlling means, such that said balloon means remains connected to said source of gas for as long as the pressure of said gas is greater than the pressure of said resilient means, said connecting means further including a protective cover for said balloon means on the housing and held

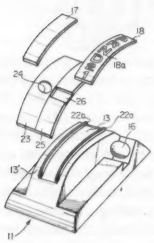
in position by resilient hooking means, said hooking means being caused to be unhooked from the housing by the pressure of said balloon means being inflated.

3,929,092

SELECTOR LEVER POSITION INDICATOR FOR MOTOR VEHICLE AUTOMATIC TRANSMISSION SYSTEM

Hisateru Ogura, Yokohama, Japan, assignor to Nissan Motor Company Limited, Japan

Filed Apr. 26, 1974, Ser. No. 464,671
Claims priority, application Japan, May 8, 1973, 48-53257
Int. Cl.² G09F *9/00*
U.S. Cl. 116—124 M **1 Claim**



1. A shift lever position indicator for a motor vehicle transmission, comprising;

a casing disposed to be mounted on a floor wall of a motor vehicle thereof, the casing having an upper curved wall having a first central slot, and a pair of windows having identical dimensions and being symmetrical to one another with respect to and on opposite sides of said first central slot, a lower curved wall in the casing having a second central slot, coextensive with said first central slot, the slots enabling a shift lever to extend therethrough and to be moved along the slots for positioning a motor vehicle transmission system;

an opaque plate member normally snugly fitted into one of the windows;

a patterned plate member normally snugly fitted into the other window and having transparent indicating pattern portions, each contoured to represent a position of the lever and transmission system, the opaque and patterned plate members having identical dimensions to enable each to be interchangeably snugly fitted into either of the two windows;

a light source within the casing, beneath the patterned plate member;

guide means on the lower wall extending along the second central slot;

a curved slide member having an opening in a central portion thereof disposed to receive a shift lever and slidably mounted in the guide means to enable positioning of the slide member by a shift lever; and

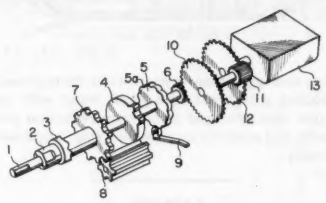
a translucent indicating member rigidly secured to the slide member, overlying said source, underlying said patterned plate member, having a distinctively light-transmissive portion juxtaposed with said opening of the slide member, said portion having such extent, longitudinally of the indicating member, as to coincide with one of the transparent pattern portions in each position of the slide member and indicating member.

3,929,093

CHANNEL INDICATING DEVICE FOR TELEVISION RECEIVING SETS

Hisao Ikeda, Fujisawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 9, 1973, Ser. No. 322,180
Claims priority, application Japan, Jan. 14, 1972, 47-6332
Int. Cl.² H03J *1/02*
U.S. Cl. 116—124.2 R **6 Claims**



1. A channel indicating device for television receiving sets, comprising:

a. a tuner having a tuner shaft projecting therefrom and a first gear affixed to said tuner shaft;

b. a main shaft having a second gear affixed thereto;

c. a fine adjustment shaft rotatably coaxially mounted on said main shaft and having a cam affixed thereto;

d. third and fourth gears coaxially mounted on a connecting shaft, said third and fourth gears having being rotatably coupled to said second and first gears respectively;

e. an arm secured to said connecting shaft and pivotally mounted about the axis of said main shaft;

f. resilient means for biasing one end of said arm in a predetermined direction;

g. lever means contacting said cam and held in abutting engagement with the other end of said arm, rotation of said fine adjustment shaft producing a relatively small displacement of said tuner shaft thereby permitting fine adjustment of said tuner,

h. an indicator shaft rotatably mounted on said main shaft and having an indicator gear affixed thereto, said indicator shaft being coaxial with said main shaft and said fine adjustment shaft;

i. an intermittent gear affixed to said main shaft; and

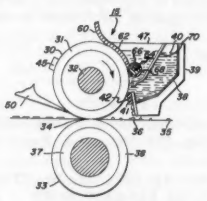
j. an intermittent pinion coupling said indicator gear and intermittent gear, the gear ratio between said indicator gear and said intermittent pinion being selected to provide a desired angular rotation of said indicator shaft for a given angular rotation of said main shaft.

3,929,094

ROLL FUSER

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

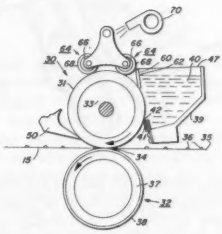
Filed Jan. 2, 1975, Ser. No. 537,881
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 **7 Claims**



1. Fuser apparatus for fixing toner images to support members, said apparatus comprising:

a heated metal fuser member;
a resilient member cooperating with said metal fuser member to form a nip through which said support members pass in order to soften said toner images;
a first sump containing release agent material to be coated on said metal fuser member;
a second sump smaller in size than said first sump and disposed within an area delineated by said first sump, said second sump also containing release agent material; and means for cleaning toner particles from said fuser members, said cleaning member being disposed in said second sump whereby the toner particles removed from said fuser member are prevented from contaminating the release agent material contained in said first sump.

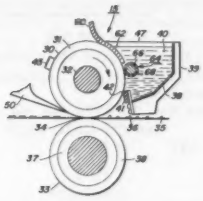
3,929,095
ROLL FUSER
Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 2, 1975, Ser. No. 537,883
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 **16 Claims**



1. Fuser apparatus for fixing toner images to substrates through the utilization of heat and pressure, said apparatus comprising:
a metal fuser roll member;
a resilient member cooperating with said metal fuser member to form a nip through which said substrates pass to thereby soften said toner images;
means for applying release agent material to the surface of said metal fuser member to facilitate removal of toner particles and other contaminates therefrom;
cleaning means disposed adjacent said metal fuser member intermediate said nip and said release agent applying means and contacting said fuser member; and
means for removing heat from said cleaning means to maintain the temperature thereof at a level which facilitates removal of toner particles from said fuser member.

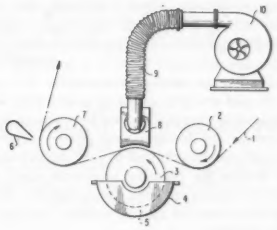
3,929,096
ROLL FUSER
Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 2, 1975, Ser. No. 537,884
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 **6 Claims**

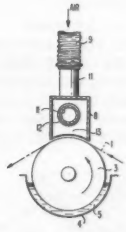
1. Roll fuser apparatus for fixing toner images to support members comprising:
a metal fuser member;
a resilient fuser member forming a nip with said metal fuser member through which said support members move;
a sump containing a quantity of release agent material; and
a cleaning member supported for contacting the surface



of said metal fuser member, said cleaning member being immersed in said release agent material.

3,929,097
APPARATUS FOR COATING A WEB
Masao Kanda, Fujinomiya, and Mineo Suefuji, Minami-ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Aug. 8, 1973, Ser. No. 386,822
Claims priority, application Japan, Aug. 9, 1972, 47-79745
Int. Cl.² B05C *1/08, 11/06*
U.S. Cl. 118—62 **5 Claims**

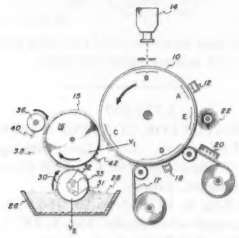




1. In a web coating apparatus employing a coating roll and means for feeding the web into contact with the coating roll periphery which carries a coating material thereon, the improvement comprising:
means defining an air chamber overlying the back of the web at the position where the web is in contact with the coating roll,
air blowing means for pressurizing said air chamber,
said air chamber being provided with a flexible membrane which directly overlies the back of the web, said flexible membrane being provided with at least one lateral opening parallel to the axis of the coating roll such that said flexible membrane flexes under static air pressure within said air chamber towards the back of said web but does not contact the back of said web,
and wherein, air escaping from said chamber between said flexible membrane and said web acts to form dyanmic air

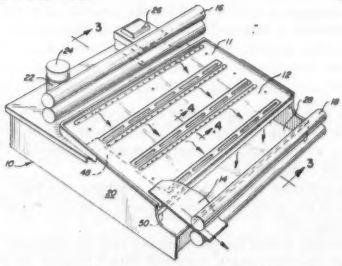
pressure means therebetween and wherein said opening within said flexible membrane directly applies static air pressure against said web.

3,929,098
TONER LOADING FOR TOUCHDOWN DONOR
Alan J. Liebman, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 28, 1973, Ser. No. 419,732
Int. Cl.² G03G *13/06*
U.S. Cl. 118—637 **6 Claims**



1. A development system for developing latent electrostatic images carried by a photoreceptor of an electrostatic processor; said development system comprising the combination of a sump for storing a supply of developer, said developer including ferromagnetic carrier particles having toner particles triboelectrically attracted thereto; a rotatable doner member positioned adjacent said photoreceptor for applying toner particles to said photoreceptor in conformity with said latent images; magnetic means disposed between said sump and said doner member for loading said doner member with toner particles; and means coupled to said doner member and said magnetic means for creating an electrostatic field between said magnetic means and said doner member for stripping the toner particles from the carrier particles during the loading of said doner member.

3,929,099
TONER APPARATUS FOR ELECTROPHOTOGRAPHIC DEVELOPMENT
Oleg Szymber, Elk Grove, and Anatoli Brushenko, Elmhurst, both of Ill., assignors to GAF Corporation, New York, N.Y.
Filed Sept. 5, 1974, Ser. No. 503,266
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **14 Claims**

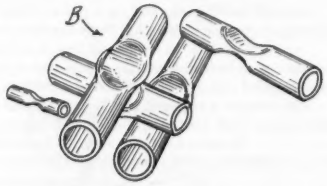


1. In apparatus for the development of latent electrostatic images on dielectric sheeting, said apparatus having a generally flat developing electrode surface for receiving said sheeting, the improvement comprising:

means for circulating toner fluid across said generally flat developing electrode surface in a generally unidirectional flowing stream of uniform thickness; and means for laying said sheeting on said flowing stream of toner fluid, whereby said sheeting is spaced from said developing electrode surface in automatic, uniform manner by said stream of toner fluid, for improved development of latent electrostatic images, and

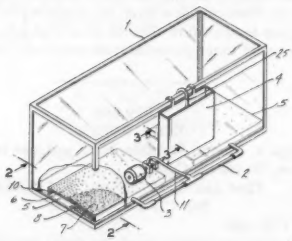
toner fluid staging means provided for supplying a flow of fresh toner fluid to a plurality of locations on said developing electrode surface, including at least one location on said developing electrode surface spaced from the edges thereof and at an intermediate point along said path of travel, and means for removing spent toner fluid from said developing electrode surface at a location upstream from said one location at said intermediate point.

3,929,100
ARTIFICIAL UNDERWATER HABITATS
Jean-Claude Thomas, Neuilly/Seine; Pierre Raoul, Epinay-/Orge, and Claude Ledoux, Massy, all of France, assignors to Rhone-Progil, Courbevoie, France
Filed June 17, 1974, Ser. No. 479,772
Claims priority, application France, June 22, 1973, 73.22836
Int. Cl.² A01K *61/00*
U.S. Cl. 119—2 **10 Claims**



1. An artificial underwater habitat for crustacea comprising a plurality of unenclosed structures of thermoplastics material having a density of from 1.2 to 2 resting on the sea bed, the structures comprising relatively straight open ended tubular elements, which are partially flattened at a position along their length while allowing substantially free circulation of water inside the tubular elements.

3,929,101
FILTRATION AND CIRCULATION SYSTEM AND APPARATUS THEREFORE
Louis N. Katz, 13415 Land O'Woods Drive, St. Louis, Mo. 63141
Division of Ser. No. 380,228, July 18, 1973, Pat. No. 3,835,813. This application July 10, 1974, Ser. No. 487,178
Int. Cl.² A01K *63/00*
U.S. Cl. 119—5 **5 Claims**



1. An aquarium comprising

a tank for containing aquatic specimens, said tank being filled with suitable aquatic medium;

a biological filter positioned within said tank, said filter being perforated and covered by aggregate;

a combined unit comprising a particulate filtration chamber and an algae propagation chamber, said chambers being separated by a perforated partition; and

means for circulating said medium throughout said tank and through said biological filter and said combined unit.

3,929,102

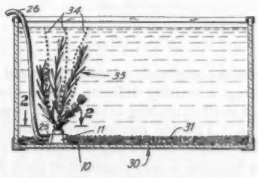
AQUARIUM AERATOR AND ORNAMENT HOLDER

Bernard Suchowski, Marlboro; David D. Lovitz, Short Hills, and Claud W. Kissin, Fort Lee, all of N.J., assignors to The Hartz Mountain Corporation, Harrison, N.J.

Filed Jan. 30, 1975, Ser. No. 545,426

Int. Cl.[2] A01K *64/00*

U.S. Cl. 119—5 **5 Claims**



1. A combination aquarium ornament stem holder and aerator comprising a hollow body portion having a base at the bottom thereof adapted to rest on the floor of an aquarium and a roof at the upper portion thereof, said roof having a plurality of air holes therein and an apertured stem-receiving portion, said body portion having a pipe fitting communicating with the interior thereof and adapted for connection to a source of air supply, whereby when air is operatively pumped through said pipe fitting it will enter the interior of said body portion and emerge as bubbles through said air holes adjacent said stem-receiving portion, thereby to flow upwardly in adjacent relation to an ornament operatively supported by said stem-receiving portion, said body portion having an annular wall defining an interior chamber, said stem-receiving portion comprising a hollow stem support extending down from said roof into said chamber, said stem-receiving portion being centrally disposed with respect to said roof and having an apertured portion communicating with said stem support, said air holes comprising a plurality of clusters of holes flanking said apertured portion, said roof having a plurality of dome-like portions each containing a cluster of said air holes.

3,929,103

DETACHER MECHANISM FOR MILKING UNIT

Gary W. Schluckbier, Madison, Wis., assignor to Dec International Inc., Madison, Wis.

Filed Dec. 6, 1974, Ser. No. 530,213

Int. Cl.[3] A01J *7/00, 9/08*

U.S. Cl. 119—14.08 **14 Claims**

1. A milking unit support and detacher mechanism comprising:

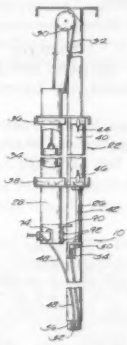
a main support column;

a vertically movable milker support column slidably mounted on said main support column;

a horizontally extending retractable milking unit support assembly mounted on said milker support column, said retractable milker unit support assembly adapted to support a milker unit on the outer end thereof when the milker unit is attached to a cow for milking, said milker unit support assembly further adapted to be retracted from its extended position underneath the cow to a retracted position adjacent the cow;

a flexible retract member fastened at one end to said retractable milking unit support assembly; and

retract means for pulling on said flexible retract member to cause said milker unit support assembly to be moved from its extended position to its retracted position, said retract means including a power cylinider having a movable



piston rod mounted on said main support column, said power cylinder being operatively connected to said flexible retract member and to said milker support column, said power cylinder adapted when energized in its retract direction to pull on said flexible retract member and to also move said milker support column upwardly in a vertical direction.

3,929,104

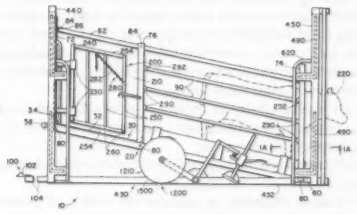
LIVESTOCK UNLOADING AND TREATING TRAILER ASSEMBLY

Dean L. Corbin, 1349 Prospect, Blair, Nebr. 68008

Filed Apr. 1, 1974, Ser. No. 456,751

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—82 **8 Claims**



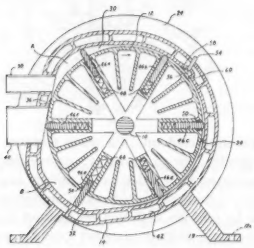
1. A livestock trailer for loading, unloading and treating livestock comprising an elongated ramp, right and left wheel means disposed on right and left sides of said ramp as seen from the top, said wheel means having surfaces suitable for engaging public roads for road travel of said trailer, means connecting said wheel means to said ramp whereby said ramp can be transported on said wheel means, said ramp having a floor having an elongated upper surface, said ramp having its upper surface placeable in a certain position downwardly inclining from one of its ends to its other end, said inclination being at an acute angle with respect to the horizontal, said ramp upper surface having a length of at least 11 feet, right and left side wall means attached respectively to said ramp at right and left sides of said upper surface and extending upwardly from said upper surface, when said ramp is in said certain position at least one of said sidewall means having in its upper half an access opening therethrough alongside said inclined ramp surface, access

door means openably closing said access opening, said access opening being of a size permitting treatment personnel to pass therethrough for access to said floor so as to be able to stand on said floor to treat an animal standing on said ramp, an openable headgate assembly in upright position at the lower end of said ramp for receiving the neck of an animal standing on said floor, means attaching said headgate assembly to one of said sidewall means.

3,929,105
ROTARY ENGINE

Lloyd Duncan Chisholm, 100 Lawrence Ave., Thunder Bay, Ontario, Canada

Filed Sept. 25, 1973, Ser. No. 400,643
Claims priority, application Canada, Oct. 13, 1972, 153893
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.09 **34 Claims**



1. A rotary internal combustion engine comprising:

a stator having a working fluid surface, an air charge intake port and a gas exhaust port spaced from said intake port; a rotor having a working fluid surface and a plurality of vanes having outer ends, said vanes being equally spaced about said rotor surface and being mounted in said rotor for reciprocation perpendicular to said rotor surface and for maintaining said vane ends in contact with said stator working fluid surface, said rotor being mounted for rotation relative to said stator whereby said respective working fluid surfaces are in opposed cooperative association so as to form in association with any two adjacent rotor vanes a plurality of serially arranged and distinct chambers, said chambers being:

an air intake chamber in association with said intake port; a compression chamber reducing in volume to a final compression chamber;

a substantially constant volume combustion chamber;

a gas expansion chamber; and

an exhaust chamber in association with siad exhaust port, said intake chamber and said exhaust chamber being adjacent but substantially closed from each other;

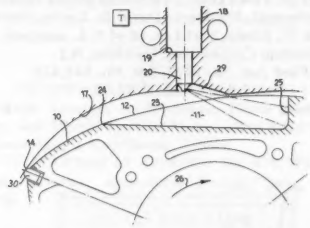
a portion of said stator working fluid surface being spaced a substantially constant distance from an opposed portion of the rotor working fluid surface for an arcuate length substantially greater than the distance between adjacent vane ends to form said final compression chamber and said constant volume combustion chamber;

fuel injector means located in said stator working fluid surface at the end of said final compression chamber and at the beginning of said constant volume combustion chamber for delivering a predetermined amount of fuel at a predetermined rate into a constant volume chamber between adjacent vanes, said substantially constantly spaced portions of said working fluid surfaces in forming said constant volume combustion chamber having an arcuate length such that substantially complete constant volume combustion of a fired air charge occurs within said combustion chamber during a combustion phase.

3,929,106
COMBUSTION CHAMBER ARRANGEMENT FOR ROTARY COMPRESSION-IGNITION I.C. ENGINES

William Murray Scott, Brighton, England, assignor to Rolls-Royce (1971) Limited, Crewe, England

Filed Oct. 1, 1974, Ser. No. 511,478
Claims priority, application United Kingdom, Oct. 5, 1973, 46660/73
Int. Cl.² F02B *53/04*
U.S. Cl. 123—8.11 **6 Claims**



1. A rotary piston compression-ignition internal combustion engine comprising: a housing defining a main chamber comprising *n* lobes; a shaft extending axially of the housing; a rotor defined by an $(n + 1)$ sided piston having flanks defining its sides, said piston being eccentrically mounted on the shaft and rotatable in the housing; a seal mounted at each apex formed between each pair of adjacent flanks of the piston; a combustion recess formed in each flank of the rotor having an end wall at its leading end extending substantially normal to the corresponding rotor flank at its intersection therewith, a substantially plane bottom wall which extends substantially at right angles to the leading end wall, and a depth which increases progressively in the direction of rotation of the rotor; and means for injecting fuel into each recess disposed in the housing and arranged to inject one or more sprays of fuel into the combustion recess, the direction of injection of the spray or sprays being essentially towards the leading end wall of the recess in the direction of rotation.

3,929,107
RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

Udo Renger, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Apr. 30, 1974, Ser. No. 465,582
Claims priority, application Germany, May 12, 1973, 2324190
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 B **9 Claims**

1. A reciprocating piston internal combustion engine comprising:

a. at least one primary cylinder;

b. at least one primary piston, the primary piston being mounted for reciprocating movement in the primary cylinder;

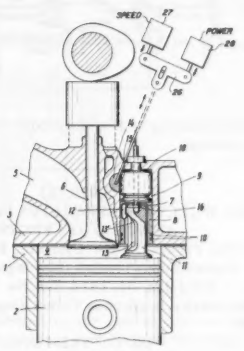
c. a cylinder head mounted to overlie the primary cylinder and with the primary cylinder and a face of the primary piston defining a primary combustion chamber;

d. at least one subsidiary cylinder formed in the cylinder head; and

e. at least one subsidiary piston, the subsidiary piston being mounted for reciprocating movement in the subsidiary cylinder,

a subsidiary combustion chamber being defined within the subsidiary cylinder and communicating with the primary combustion chamber, the subsidiary piston being mounted to move upwardly in the subsidiary cylinder during upward movement of the primary piston in the primary cylinder and having means for interrupting, at least intermittently, the communication between the

primary and subsidiary combustion chambers, the subsidiary piston being dimensioned to compress an air-fuel mixture in the subsidiary combustion chamber to a higher pressure than the air-fuel mixture compressed in the primary combustion chamber by the primary piston,



f. wherein a first recess is formed in an axial surface of said subsidiary piston that cooperates with a second recess formed in a rotatable cylindrical sleeve surface that defines said subsidiary combustion chamber and is separate from the subsidiary piston to provide communication between the primary and secondary combustion chambers when the subsidiary piston is at about top dead center.

3,929,108

ELECTRONIC CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

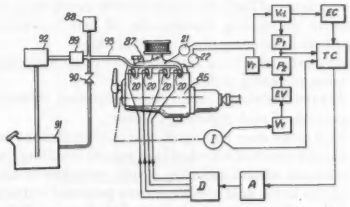
Louis A. Monpetit, 16 Bis Chemin de la Butte, 78 L'Etang-la-Ville, France, and Daniel R. Fournier, 13 Frans Halsstraat, Lisse, Netherlands

Filed Mar. 25, 1974, Ser. No. 454,679

Claims priority, application France, Aug. 24, 1970, 70.30910

Int. Cl.² F02D *5/00*

U.S. Cl. 123—32 EA **20 Claims**



1. In an electronic system for controlling the duration of injections in a fuel injection internal combustion engine having electrically actuated means for cyclically injecting fuel during discrete time periods in response to successive fuel injection signals of predetermined duration and means for sensing one operating parameter of an engine, said electronic control system being of the type that includes means for generating a regulating voltage that is a function of such an engine operating parameter and timing means responsive to the regulating voltage and to the operating cycle of such an engine for generating successive fuel injection signals in successive engine cycles, each signal having a duration depending on the amplitude of the regulating voltage, the improvement wherein the means for generating the regulating voltage comprises:

means, adapted for connection to a means for sensing one operating parameter of such an engine, for generating a noncyclical input voltage having a magnitude that is at all times a function of the one engine operating parameter and

means responsive to the magnitude of the input voltage for generating an output voltage having a magnitude that at all times is a predetermined nonlinear function of the input voltage, the curve of the output voltage as a function of the input voltage consisting of a predetermined plurality of curve segments having different average slopes.

3,929,109

LEAK-OFF PIPE FOR FUEL INJECTION EQUIPMENT

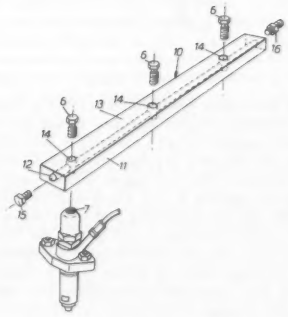
Noel Christopher Chamberlain, 63 Peterborough, Eye Peterborough, England

Division of Ser. No. 324,944, Jan. 19, 1973. This application June 12, 1974, Ser. No. 478,558

Claims priority, application United Kingdom, Jan. 22, 1972, 3139/72; Jan. 5, 1973, 701/73

Int. Cl. F02b *3/00*

U.S. Cl. 123—32 R **1 Claim**



1. A fuel injection manifold having a plurality of injector nozzles comprising a malleable, flexible pipe with a plurality of holes therein normal to the longitudinal axis of said pipe, opposing walls on said pipe having substantially plane and parallel surfaces normal to the holes in said pipe, side walls on said pipe to enclose and form a passage for conveying fluid and intersecting the holes of said pipe, a cross section for said opposing walls of a thickness relative to the size of said passage to permit local deformation of the malleable material under a load applied normal thereto and intersecting the passage, a corresponding plurality of bolts having conduits therein to permit fluid communication with the passage of said pipe when said bolts are inserted in the holes therein, said bolts fastening to said injector nozzles with said pipe therebetween to provide a load normal to said plane surfaces to fluidly seal said bolt with said pipe and said pipe with said injector nozzles by deformation of the malleable material of said pipe.

3,929,110
LUBRICATION SYSTEM OF A TWO-STROKE INTERNAL COMBUSTION ENGINE

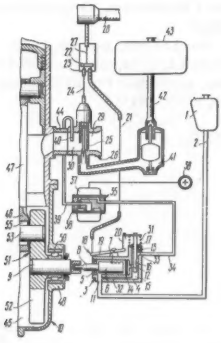
Ivan Yakovlevich Raikov, ulitsa B. Galushkina, 26, kv. 34; Pavel Andreevich Ivaschenko, ulitsa Glebovskaya, 4, kv. 51; Alexandr Nikolaevich Judin, Kutuzovsky prospekt, 435/30, kv. 69, all of Moscow; Georgy Lvovich Pisarev, ulitsa Pushkinskaya, 213, kv. 6, Izhevsk, and Vladimir Yakovlevich Roslyakov, ulitsa Streletskaya, 3, kv. 17, Vladimir, all of U.S.S.R.

Filed Jan. 24, 1974, Ser. No. 436,378

Claims priority, application U.S.S.R., Jan. 26, 1973, 1871348

Int. Cl.² F01M *1/00*

U.S. Cl. 123—73 AD **2 Claims**



1. A lubricating system incorporable in a two-stroke internal combustion engine including means for introducing fuel into said engine through a carburetor, said system including a worm-type oil pump to effect continuous positive supply of a liquid lubricant into said engine, said oil pump having a worm connected directly to the crankshaft of said engine and a metering device comprising a smooth sleeve and a helically threaded stud received in said sleeve, the thread of said stud and the walls of said sleeve defining a throttling passage; said pump and said metering device being arranged in a common housing and connected hydraulically with each other so that the outlet passage of said pump serves as the inlet passage of said throttling passage of said metering device whose outlet passage is connected hydraulically with said means for introducing fuel into said engine.

3,929,111
FUEL FEED SYSTEM FOR RECYCLING FUEL

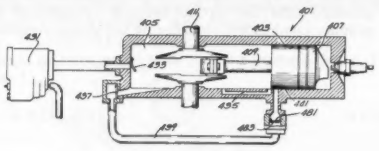
Robert K. Turner, Waukegan, and Edgar Rose, Glencoe, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 402,322, Oct. 1, 1973, abandoned, which is a division of Ser. No. 228,775, Feb. 23, 1972, abandoned, which is a division of Ser. No. 17,729, March 9, 1970, abandoned. This application Dec. 5, 1974, Ser. No. 529,860

Int. Cl.² F02B *33/04*

U.S. Cl. 123—73 R **1 Claim**

1. A two-cycle internal engine including a crankcase having a portion in which "drains" accumulate, a cylinder extending from said crankcase, a piston movable in said cylinder and relative to said crankcase, a transfer passage communicating, subject to piston operation, between said crankcase and said cylinder, a conduit communicating with said crankcase portion, valve means in said conduit preventing flow to said crankcase and permitting flow from said crankcase, said conduit communicating with said cylinder independently of said transfer passage.



3,929,112
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

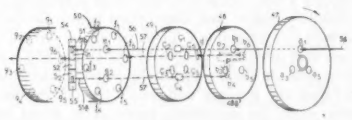
Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Jan. 31, 1974, Ser. No. 438,355

Claims priority, application United Kingdom, Jan. 31, 1973, 4763/73

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 BC **1 Claim**



1. In fuel injection apparatus for an internal combustion engine, such apparatus incorporating metering means for determining the quantity of fuel delivered in each cycle of operation, which metering means includes a metering piston and a metering cylinder having faces in face-to-face sliding contact with each other, and commutating valve means having stationary and rotary components of which the latter is adapted to be driven in timed relation with the crankshaft or other rotary output member of the engine, and which are in combination operative to define connections between cylinder spaces in said metering cylinder on opposite sides of said metering piston respectively to a pump means for said fuel and an outlet means with reversal of such connections for successive injections of fuel, the improvement being the provision of means for preventing transference of fuel between opposite sides of said metering piston, comprising:

a. At least one groove formed in the circumferential face of same metering piston,

b. Means defining a drain duct extending through a body portion of said metering cylinder,

c. Said drain duct having an entrance positioned intermediate the limits of travel of said groove resulting from reciprocation of said metering piston, whereby in each stroke of the latter said groove moves past said entrance,

d. Means for collecting leakage fuel from said drain duct.

3,929,113
FUEL INJECTION PUMP

Koichi Kawase, Higashi-Matsuyama, and Yasuhide Suzuki, Saitama, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Japan

Filed Apr. 29, 1974, Ser. No. 465,349

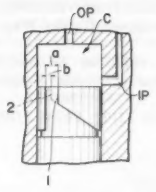
Claims priority, application Japan, May 7, 1973, 48-52638[U]

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R **1 Claim**

1. In a fuel injection pump comprising a plurality of pump devices each including a chamber and a plunger slidably disposed in oil tight relationship within the chamber, each said

plunger including a helical control edge formed thereon which cooperates with a port in the chamber to control the amount of fuel supplied, said pump devices being controlled from a common fuel rod, and a plurality of said plungers including a vertical fuel supply groove which opens at the top of the



plunger and is connected to the helical control edge at a portion of the latter which corresponds to the engine idling position, the improvement wherein the width of the vertical groove is varied for each said plunger so as to provide a predetermined variation in the total amount of fuel to be supplied to the engine.

3,929,114

FUEL INJECTOR ARRANGEMENT FOR COMPRESSIVE MIXTURE INTERNAL COMBUSTION ENGINES

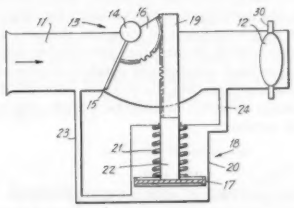
Asoke Chattopadhayay, Norf, and Karl Schmidt, Wehl, both of Germany, assignors to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft, Neuss, Germany

Filed Aug. 12, 1974, Ser. No. 497,148

Claims priority, application Germany, Aug. 13, 1973, 2340834

Int. Cl.² F02M 9/06

U.S. Cl. 123—139 R **11 Claims**



1. In a fuel injector arrangement for compressive mixture internal combustion engines including a fuel quantity control installation, and an air intake passageway having a variably actuatable throttle valve disposed therein, the improvement comprising a shaft eccentrically located in said air passageway upstream of said throttle valve, differential pressure producing means for actuating said fuel quantity control installation mounted on said shaft and including a baffle valve, said differential pressure producing means being adapted to measure the air flow rate through said passageway, pneumatic control power amplifier means, and means for mechanically connecting said baffle valve and said control power amplifier means.

3,929,115

MEANS FOR CLEANING EXHAUST GAS IN A RECIPROCATING PISTON TYPE AUTOMOBILE ENGINE

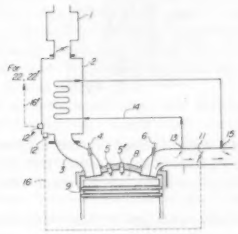
Teruo Yamauti; Yoshishige Oyama, both of Hitachi, and Yukio Hohsho, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 16, 1973, Ser. No. 341,847

Claims priority, application Japan, Mar. 17, 1972, 47-27288

Int. Cl.² F02P 1/00

U.S. Cl. 123—148 R **9 Claims**



1. Means for reducing noxious constituents in exhaust gas of a reciprocating piston type engine comprising fuel supply means for supplying relatively lean fuel air mixture having an air fuel ratio of 18 to 23, fuel atomizing means including heating means for sufficiently atomizing the fuel in the mixture supplied from said fuel supply means to a combustion chamber of the engine continuously in response to temperature changes in the fuel atomizing means, a primary and an auxiliary ignition plug disposed in each engine combustion chamber, and an ignition timing control mechanism varied in response to temperature changes in the fuel atomizing means for determining the ignition timing of the auxiliary ignition plug independently from that of the primary ignition plug.

wherein said ignition timing control mechanism includes an advance mechanism which is operated in response to the engine speed, such that both of the ignition plugs are energized simultaneously under a relatively low engine speed while the ignition timing of the primary ignition plug is advanced under medium and high speed engine operation at a greater rate than that of the auxiliary ignition plug so that the difference between the timings of the ignition plugs is increased in response to the increase in the engine speed and wherein said ignition timing control mechanism is provided with an acceleration compensating mechanism for advancing the timing of the auxiliary ignition plug during engine deceleration.

3,929,116

MODULATING COMPRESSION RELEASE FOR AN ENGINE

Brent L. Peterson, 2916 River Road, Tacoma, Wash. 98404

Filed Nov. 5, 1973, Ser. No. 412,800

Int. Cl.² F01L 13/08

U.S. Cl. 123—182 **24 Claims**

1. A device for connection to a head of an engine for compression release from the top of an engine cylinder comprising:

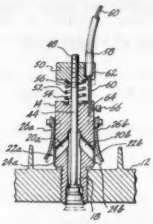
a. a housing one end of which has means for fastening to an engine head and having a passage extending longitudinally from inside a compression chamber to communicate through at least one lateral opening to atmosphere,

b. a first valve at an entrance to the longitudinal passage having a valve stem centered in the longitudinal passage.

c. a reed fastened to the housing and located to cover the lateral opening,

d. means for acting on the valve stem to control the first valve.

e. means for restricting the clearance between the stem and the passage to control the flow of gases therethrough, wherein the means for restricting the clearance comprises:



f. an enlarged cross section in the longitudinal passage immediately adjacent the entrance therein,

g. a first enlarged section on the stem contiguous to the valve, and

h. a second smaller enlarged section on the stem contiguous to the first enlarged section.

3,929,117

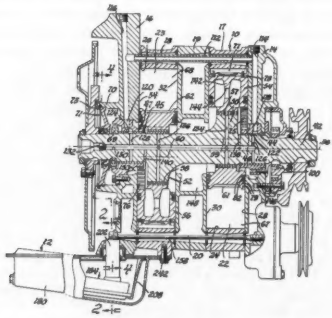
ROTARY ENGINE OIL TANK VENT

Raymond J. Green, Northville, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1974, Ser. No. 518,574

Int. Cl.² F01M *1/10*

U.S. Cl. 123—196 R **2 Claims**



1. A rotary engine including a pair of end housings and a crankshaft rotatably supported in said end housings and an annular end cover received about said crankshaft normally covering an oil supplied cavity on the outboard side of one of said end housings, said one end housing having located underneath a drain-vent hole to which oil drains and through which air can be vented into the engine and also having located underneath a suction-vent hole through which oil can be supplied to the engine's lubrication system and also through which air may be vented into the engine, an oil tank secured to said engine in an underneath location, said oil tank having a drain-vent hole sealingly connected to the drain-vent hole in said one end housing, said oil tank also having a suction-vent hole sealingly connected to the suction-vent hole in said one end housing, suction passage means extending from said oil tank through said suction-vent holes into said engine, vent passage means also extending from said oil tank through said suction-vent holes into said engine, said end cover having a wall cooperating with said end housing on the outboard side to provide a quiet zone shielded from said oil supplied cavity elevated above said oil tank, an upwardly extending elongated vent passage in said one end housing connecting said vent passage means to said quiet zone at a low location, and another vent passage in said one end housing connecting said quiet zone at a high location to the engine's internal breathing system at a place away from any oil drainage.

3,929,118

I.C. ENGINE IMPROVEMENTS

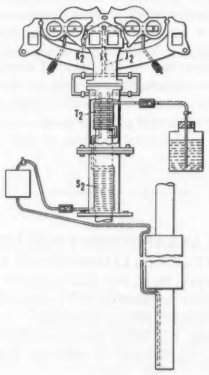
Chai Mun Leong, 108 Serangoon Garden Way, Singapore 19, Malaysia

Filed June 11, 1973, Ser. No. 368,726

Claims priority, application United Kingdom, June 13, 1972, 27617/72; Mar. 26, 1973, 18986/73

Int. Cl.² F02B *75/02*; F02M *23/00*

U.S. Cl. 123—198 A **13 Claims**



5. An internal combustion engine having a carburettor for feeding fuel/air mixture to a mixture inlet and an exhaust system for burnt gases, in which engine the mixture inlet has at least one air inlet passage for admitting and directing a corresponding number of streams of extra, heated air to impinge upon and mix turbulently with the fuel/air mixture from the carburettor and vaporize fuel droplets therein, and in which engine furthermore, means are provided for causing a solution of a copper-salt combustion catalyst to pass in preheated and vaporized form into the mixture inlet and thence into the combustion chamber or chambers of the engine and into the exhaust system.

3,929,119

SELF-ENERGIZED PLASMA COMPRESSOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Edward L. Shriver, Huntsville, Ala., and Eduard B. Igenbergs, Munich, Germany

Division of Ser. No. 367,606, June 6, 1973, Pat. No. 3,854,097. This application Aug. 27, 1974, Ser. No. 500,982

Int. Cl.² F41F *7/00*

U.S. Cl. 124—1 **3 Claims**

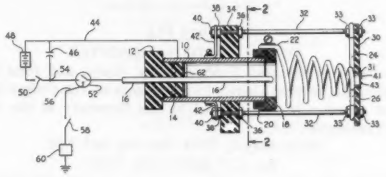
1. An apparatus for producing high temperature compressed plasma comprising:

a. an elongated cylindrical first electrode;

b. a central rod electrode disposed coaxially of said first electrode out of contact therewith;

c. an electrically conductive element extending between said central rod electrode and an inner end of said first electrode;

d. means for applying a high voltage to said first electrode and said central rod electrode for causing said electrically conductive element to ionize producing a plasma which is accelerated out of the outer end of said first electrode;
e. an insulating connecting means carried on an outer end of said first electrode;
f. an elongated electrically conductive helical coil having a large diameter end and a small diameter end;
g. said large diameter end of said helical coil being connected to said connecting means and said small diameter end being spaced longitudinally therefrom;
h. means for electrically connecting said small diameter end of said helical coil to said first electrode;
i. said helical coil being in axial alignment with said elongated cylindrical first electrode so that a current path is



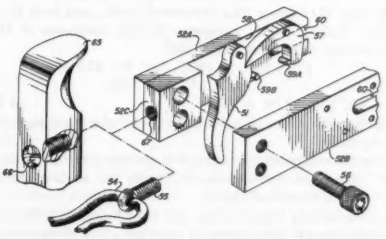
formed between an outer end of said central rod electrode and said helical coil as said plasma is accelerated out the outer end of said first electrode producing current flow through said helical coil which in turn produces a time varying magnetic field that compresses said plasma adjacent said small diameter end of said coil;
j. whereby a source of high temperature compressed plasma is produced adjacent said small diameter end of said helical coil;
k. a thin foil member carried adjacent said small diameter end of said helical coil; and
l. a supply of beads carried on an outer surface of said thin foil member so that said compressed plasma penetrates said thin foil member propelling said beads to high velocities.

3,929,120

COMBINED BOWSTRING DRAW AND TRIGGER RELEASE MECHANISM FOR USE IN ARCHERY

Roland K. Barner, P.O. Box 1035, Bozeman, Mont. 59715

Division of Ser. No. 444,526, Feb. 21, 1974, Pat. No. 3,845,752. This application Aug. 2, 1974, Ser. No. 494,164
Int. Cl.² F41C *19/00*
U.S. Cl. 124—35 A **1 Claim**



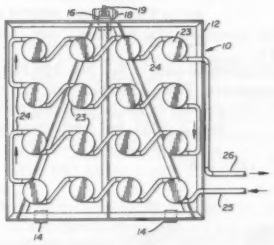
1. A bowstring holding and release device comprising in combination:
a handle member adapted to be gripped by the human hand,
holding and release means attached to said handle member for releasably engaging a bowstring,
said holding and release means comprising a pivotally mounted holding member for movement between first and second positions for holding and releasing a bowstring respectively,
trigger means pivotally mounted on said holding and release means for engaging a first end portion of said holding member to retain said holding member in said first position when said trigger means is in a first pivoted position, said trigger means being pivotable to a second position out of engagement with said portion to permit said holding member to pivot to its second position for releasing a bowstring,
said holding member when manually moved to said first position being engaged by said trigger means,
said holding and release means being provided with a U-shaped opening into which a part of a bowstring is inserted, and means for detachably holding said part of a bowstring in said opening,
flexible cord means connected to said holding and release means and comprising a shield fixed to said cord means at its free end for forming a stop and support when a hand of an archer grips said cord means between said shield and said holding and release means,
said cord means between said shield and said holding and release means being covered by a pliable cylindrical member, and
said shield and said cylindrical member being formed of plastic.

3,929,121

SOLAR HEAT COLLECTOR

Bruce C. Rogers, 915 Georgetown Road, Salem, Ohio 44460

Filed Aug. 1, 1974, Ser. No. 493,566
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**

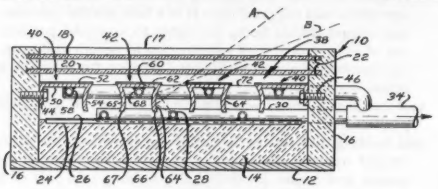


1. In a solar heat collector having a plurality of heat collecting elements, each of which comprises a round hollow transparent member having spaced flat top and bottom walls with a peripheral wall joining their annular edges, inlet and outlet openings in said peripheral wall, at least one of said inlet and outlet openings tangentially arranged with respect to said peripheral wall, means for circulating fluid to be heated successively through said heat collecting elements and a plurality of light magnifying lenses each of which is arranged in spaced parallel relation to one of said heat collecting elements and spaced with respect thereto a distance equal to the focus depth of light passing through said lens so that said magnified light is at its maximum magnification on said heat collecting element.

3,929,122
SOLAR ENERGY COLLECTOR

Kalil A. Alkasab, Wheaton, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 18, 1974, Ser. No. 525,037
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**

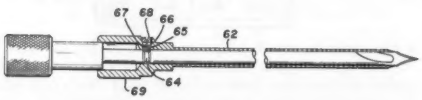


1. In a solar energy collector of the type having a flat energy absorbing plate mounted on an insulating base and covered by at least one transparent surface spaced above said flat plate, the energy absorbing plate having a plurality of liquid containing conduits integral with its surface for carrying heat away from said plate, the improvement comprising upper absorption means positioned beneath said at least one transparent surface and above said flat plate and in predetermined spaced relation thereto, said upper absorption means including a plurality of spaced apart, generally coplanar, upwardly facing absorption surfaces, each of said plurality of coplanar absorption surfaces having at least one outwardly concave focusing surface projecting from an edge thereof in a direction inwardly of said edge and generally downward from said coplanar absorption surface, at least one liquid carrying conduit integral with and extending downwardly from the bottom of each of said coplanar absorption surfaces, said last named conduits and at least a portion of the surfaces with which they are integral being in uninterrupted vertical communication with portions of said flat energy absorbing plate and adapted to receive radiation emanating upwardly therefrom.

3,929,123
MUSCLE BIOPSY NEEDLE

Khosrow Jamshidi, 610 Winston Court, Minneapolis, Minn. 55118

Continuation-in-part of Ser. No. 330,184, Feb. 7, 1973, abandoned. This application Jan. 9, 1974, Ser. No. 432,097. The portion of the term of this patent subsequent to Jan. 2, 1991, has been disclaimed.
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 B **4 Claims**



1. Biopsy means for obtaining muscle tissue specimens from a body and comprising:

a. blade means comprising a generally cylindrical shaft and having a shank portion with an inwardly tapered pointed distal puncturing and cutting tip;

b. hollow tubular sheath means slidably enveloping said blade means with free axial and arcuate rotational motion of said sheath means relative to said cylindrical shaft and providing a hollow blade receiving sleeve with the circumferential distal tip end of said sheath terminating along a plane normal to the tubular axis and being tapered inwardly at the distal tip end in continuation with the taper formed on said blade and forming an extension of said pointed puncturing and cutting tip;

c. a sample receiving slot formed in said blade means and forming a sample retaining cavity in said blade at a point spaced from the distal tip thereof and disposed adjacent the surface of said shaft along said shank portion and adjacent said tapered zone;

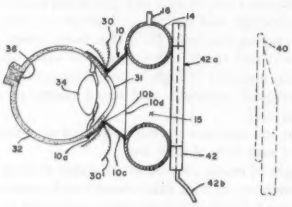
d. said sheath being slidable over said blade between retracted and extended dispositions, with the forward edges of said sheath enclosing said sample receiving slot when said blade is in said retracted disposition and with the said sample receiving cavity being exposed when said blade is in said extended disposition; and

e. detent means being formed along said cylindrical shaft, and a mating plunger member is provided along the axial length of said sheath means, the arrangement being such that when said distal tip end of said sheath reaches the proximate end of the taper formed on said blade, said plunger is received within said detent means.

3,929,124
OPTHALMODYNAMOMETER

Michael E. Yablonski, Golden Valley, Minn., and John Nichparenko, Willow Grove, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1974, Ser. No. 465,978
Int. Cl.² A61B *3/00, 5/02*
U.S. Cl. 128—2 T **6 Claims**



1. An ophthalmodynamometer comprising:

a speculum member provided with a viewing port;

a pressurized toroidal bladder attached to said speculum member with the eye of the toroidal bladder coaxial with said speculum viewing port; and

means operatively connected to said bladder for determining the internal pressure of said bladder.

3,929,125
ECTOPIC BEAT DETECTOR

Clarence W. Barnes, San Francisco, Calif., and Jack H. Shore, San Rafael, Calif., assignors to The Institutes of Medical Sciences, San Francisco, Calif.

Filed Dec. 3, 1973, Ser. No. 420,805
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 A **16 Claims**

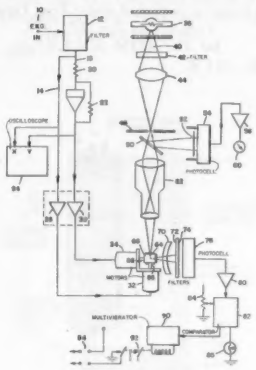
1. A method for monitoring a cyclic electrical signal which comprises:

continuously transforming said electrical signal into a repetitive light beam pattern specific for each cycle of said cyclic electrical signal;

continuously transmitting said light beam pattern to a photochromic glass plate to imprint a two-dimensional pattern specific for each cycle of said cyclic electrical signal;

continuously transforming the light transmitted through said photochromic glass plate into a light intensity dependent electrical signal defining a base signal level corresponding to the repetitive cycle resulting from each cycle of said cyclic electric signal; and

actuating a signaling device when said light intensity dependent electrical signal differs from said base signal level by



a predetermined amount corresponding to an aberrant cycle.

3,929,126

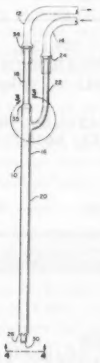
SURGICAL SUCTION IRRIGATOR

Jay C. Corsaut, Box 7703, South Lake Tahoe, Calif. 95731

Filed Sept. 26, 1974, Ser. No. 509,484

Int. Cl.² A61M *3/00*

U.S. Cl. 128—240 **5 Claims**



1. A medical irrigator for flushing wounds with a liquid comprising:

a. a first conduit having a first terminal open end and a second end having means for connecting said second end to a liquid supply means for delivering liquid to said first conduit;

b. a second conduit having a first terminal open end and a second end having means for connecting said second end to a liquid suction means for removing liquid from said conduit, said second conduit positioned within said first conduit and displaced from said first conduit, wherein said terminal end of said first conduit has a scalloped edge that is inwardly pinned against the outer surface of said second conduit forming a plurality of apertures therebetween.

3,929,127

DIVER'S BREATHING APPARATUS WITH GAS PURIFYING SYSTEM

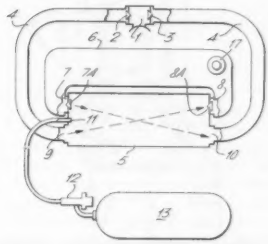
Terence Barrington Paul, 72 Carmen Drive, Carlingford, New South Wales, Australia (2118)

Filed June 25, 1974, Ser. No. 482,966

Claims priority, application Australia, Feb. 6, 1974, 6482/74

Int. Cl.² A62B *7/02*; B63C *11/22*

U.S. Cl. 128—142 **11 Claims**



1. A breathing apparatus comprising a first and a second gas conduit loop, a gas purifier chamber which forms a common portion of the two gas conduit loops over part of their length, a gas purifying substance contained within said chamber, means for permitting only uni-directional flow of gas through each of said loops and the gas purifier chamber, a mouthpiece orifice located in the first of said loops, a gas tight inflatable bag forming part of the second of said loops and means for admitting make-up gas to the apparatus whereby the gases flowing into the mouthpiece orifice flow through the gas purifying substance twice in the same direction before being returned to the mouthpiece orifice.

3,929,128

DISPOSABLE HUMIDIFIER

Michael O. Pekkarinen, Lincolnshire, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

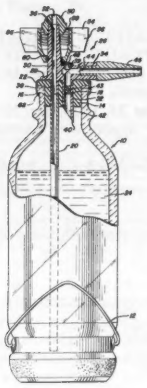
Continuation-in-part of Ser. No. 304,943, Nov. 9, 1972, Pat. No. 3,834,385. This application Apr. 10, 1974, Ser. No. 459,498. The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.

Int. Cl.² A61M *15/00*

U.S. Cl. 128—194 **2 Claims**

1. An oxygen humidifier set which comprises: an intravenous solution bottle having a stopper defining a first opening and a second opening, an airway tube connected to the wall of the stopper defining said first opening with said airway tube being coaxial with said first opening and extending to the lower portion of said bottle, said first and second openings being in communication with the inside of the bottle; a connector assembly for coupling said intravenous solution bottle to an oxygen supply, said connector assembly comprising an oxygen inlet member, means for coupling the upper portion of said oxygen inlet member to the oxygen supply, the lower portion of the oxygen inlet member comprising an oxygen inlet tube coupled to said first opening in communication therewith; an outlet tube for providing an outlet path for the humidified oxygen, said outlet tube being inserted into said second opening, a humidified oxygen outlet in communication with said outlet tube, said humidified oxygen outlet being adapted for coupling to an oxygen administration device; means located in the outlet path of the oxygen humidifier for preventing liquid droplets from passing, said liquid droplets preventing means comprising a filter plug formed of a material

having a substantially hydrophobic surface, said plug having a pore size of 20 to 500 microns; and means carried by the



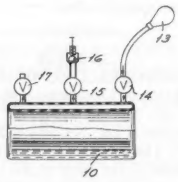
connector assembly and engaging the intravenous solution bottle for retaining said connector assembly in engagement with said bottle and for supporting the bottle.

3,929,129

DEVICE FOR CHECKING BLOOD PRESSURE

Rene F. Archambault, 35550 Michigan Ave., Wayne, Mich. 48184

Filed Dec. 16, 1974, Ser. No. 533,297
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2.05 C **11 Claims**



1. In a device for checking blood pressure, the combination comprising

an inflatable hollow band adapted to encircle a limb,

pump means connected to said band for inflating said band,

a first pressure relief valve on said band and set to relieve pressure at a first predetermined pressure,

on-off valve means associated with said first pressure relief valve for disabling said first pressure relief valve,

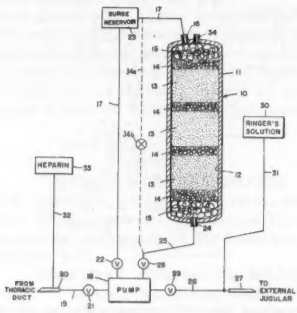
a second pressure relief valve associated with said hollow band and set for relieving the pressure of said band at a higher setting than said first pressure relief valve such that, the blood pressure may be checked by actuating said pump means until the pulse of the person being checked is interrupted in said limb or until the first pressure relief valve operates to relieve the pressure, thereafter actuating said on-off valve means if said first pressure relief valve has been actuated to disable said first pressure relief valve and continuing the application of pressure until the pulse of the individual is interrupted or the second pressure relief valve is actuated indicating a more serious condition of blood pressure.

3,929,130

METHOD FOR LYMPHOCYTE DEPLETION

Thomas S. Hargest, 1078 Winslow Drive, Charleston, S.C. 29412

Filed Oct. 30, 1972, Ser. No. 302,271
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A61M *01/03, 05/00*
U.S. Cl. 128—214 R **10 Claims**



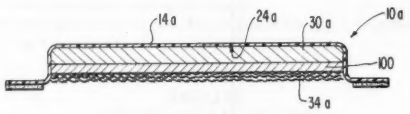
1. A method for removing lymphocytes from the lymph of a living vertebrate, comprising the steps of surgically redirecting the flow of lymph from a major lymph duct into a filter column containing a mass of irregularly-shaped glass microparticles having sizes within the range of about 37 to 105 microns, controlling the rate of flow of lymph through said column to maintain a velocity of approximately 12 to 20 centimeters per hour, and returning the filtrate to the vascular system without interrupting the flow thereof.

3,929,131

BANDAGE AND METHOD OF USING SAME

Thomas L. Hardwick, 2512 W. Vivion Road, North Kansas City, Mo. 64151

Filed Jan. 9, 1975, Ser. No. 539,732
Int. Cl.² A61F *7/00*
U.S. Cl. 128—254 **5 Claims**



1. A bandage comprising:

an elongated main body strip having a central panel and side panels;

the side panels each having opposite inner and outer surfaces;

adhesive on said inner surfaces;

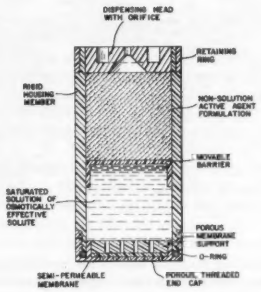
the central panel having inside and outside surfaces;

pad means engaged against the inside surface of the central panel, the pad means comprising a block of material having the characteristic of heat exchange at a slow rate; means retaining the pad means against said inside surface of the central panel, the means for retaining the pad means comprising a gauze panel overlying the pad means; at least the central panel being maintained at a temperature of less than 32°F prior to application to a wound; and a block of medication adapted to be frozen and to be released in liquid form upon thawing interposed between the pad means and the gauze panel.

3,929,132
OSMOTIC DISPENSER

Takeru Higuchi, Lawrence, Kans., assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 349,774, April 10, 1973, abandoned. This application July 23, 1974, Ser. No. 490,934
Int. Cl.² A61M *31/00*
U.S. Cl. 128—260 **9 Claims**



1. An osmotic active agent dispenser comprised of a first compartment of relatively impervious material containing an active agent and provided with means for releasing the active agent to the exterior of the dispenser, and a second compartment of controlled permeability to water containing a solution of an osmotically effective solute which exhibits an osmotic pressure gradient against water, the said first and second compartments having a barrier member such that the said first compartment diminishes in volume in response to an increase in volume of the solution in the said second compartment via absorption of water by osmosis therein and defining a means for establishing a substantially zero order rate of release as water flows into the dispenser in a tendency towards osmotic equilibrium with its environment, so that the active agent is continuously squeezed thereout at an osmotically controlled rate over a prolonged period of time; said active agent being formulated in a form other than wholly in liquid solution, and characterized by a consistency at least as firm as that of the semisolid state, whereby the uniformity of dosage of the said active agent over the said prolonged period of time is assured.

3,929,133
APPARATUS FOR REMOVING, WASHING AND DISPLAYING FRAGMENTARY PRODUCTS OF OPERATIVE PROCEDURES

Mohamed Ismail Ragab, Cairo, Egypt, assignor to International Pregnancy Advisory Services, Chapel Hill, N.C.

Filed Nov. 20, 1974, Ser. No. 525,512
Int. Cl.² A61M *1/00*
U.S. Cl. 128—277 **11 Claims**

1. In a system for removing from the uterus intermixed liquid and non-liquid products of a pregnancy preparatory to external examination of selected removed non-liquid products, comprising in combination:

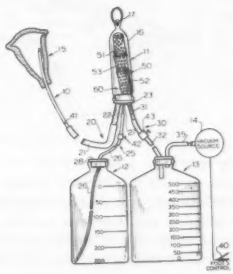
a. an aspiration cannula sized to permit insertion into the uterus;

b. an aspirate collection chamber adapted to be supported proximate the uterus and having:

1. an outer imperforate transparent wall structure providing an enclosed collection space with a first entrance port having a tubular connection to the cannula for receiving the products, a second entrance port for admitting water to the chamber in a predetermined pattern to wash the products received therein and a third exit port for discharging the products; and

2. filter means comprising a perforate wall structure having plural holes of uniform size formed therein, said filter means being mounted within the collection chamber and being formed and arranged so as to isolate an inner space within the collection chamber which communicates only with said third exit port from the remainder of the space therein communicating with the said entrance ports such that any product flow between the entrance and exit ports is directed through said holes; and

c. vented container of water having a tubular connection to said second entrance port,

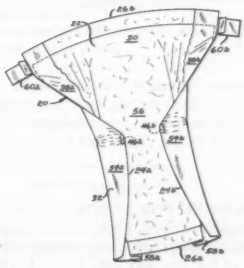


whereby with an appropriate level of vacuum applied to the exit port and the cannula in the uterus, the intermixed products along with water are drawn through the respective entrance ports into the collection chamber but externally of the isolated inner space followed by the liquid and non-liquid products of less size than said hole diameter being drawn through said perforate structure into such inner space and through the exit port towards the source of such vacuum leaving the filtered out products on display on said perforate wall structure for immediate visual examination.

3,929,134
ABSORBENT ARTICLE AND METHOD

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 495,356
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **24 Claims**



1. A disposable diaper comprising, an absorbent pad assembly having a front surface, a back surface, a pair of side edges, a first fold of said pad assembly along a first pair of longitudinally extending fold lines defining a pair of side panels extending between said side edges and the first pair of fold lines, said side panels being folded against the front surface of the pad assembly, and a second fold of the pad assembly along a second pair of longitudinally extending fold lines intermediate

said side edges and first fold lines, the second fold lines defining doubled edge sections remote said side edges being folded against the back surface of the pad assembly.

3,929,135

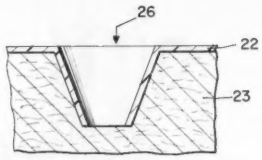
ABSORPTIVE STRUCTURE HAVING TAPERED CAPILLARIES

Hugh Ansley Thompson, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1974, Ser. No. 535,003

Int. Cl.² A41B *13/02*

U.S. Cl. 128—287 **8 Claims**



1. A disposable diaper comprising a topsheet and an absorbent element wherein said topsheet is a liquid-impermeable material provided with tapered capillaries each having a base in the plane of said topsheet and an apex remote from said plane of said topsheet, having an angle of taper of from about 10° to about 60°, base opening dimension of from about 0.006 to about 0.250 inch, and apex opening dimension of from about 0.004 to about 0.100 inch; and wherein said absorbent element is in intimate contact with said apex of said tapered capillaries.

3,929,136

APPARATUS FOR LOW-TEMPERATURE SURGERY

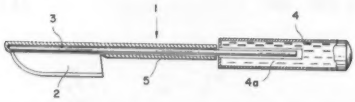
Helmut Kreeb, Immenstaad; Gerhard Hauser, Friedrichshafen, and Klaus Kögler, Bermatingen, all of Germany, assignors to Dornier System GmbH., Germany

Filed Nov. 18, 1974, Ser. No. 525,027

Claims priority, application Germany, Dec. 8, 1973, 2361273

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.1 **7 Claims**



1. An apparatus for use in low temperature surgery comprising surgical instrument means, heat pipe means connected to said instrument means and functioning as a handle, and low temperature cell means connected to said heat pipe means.

3,929,137

SONIC WARNING FOR ELECTROSURGICAL DEVICE

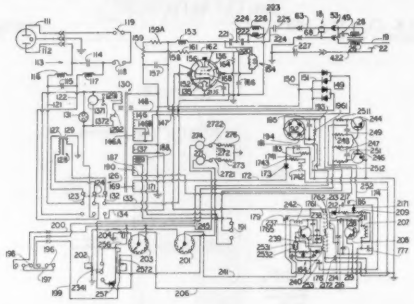
Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research & Development Corporation, Milford, Del.

Division of Ser. No. 414,646, Nov. 12, 1973, Pat. No. 3,870,047. This application Dec. 5, 1974, Ser. No. 529,607

Int. Cl.² A61B *17/36;* **A61N** *3/02*

U.S. Cl. 128—303.14 **2 Claims**

1. In an electrosurgical device, means for generating an electrosurgical cutting current, a sonic warning device connected to the means for generating the electrosurgical cutting current including means to produce a sound signal of a selected frequency when the electrosurgical cutting current is generated, means for generating an electrosurgical coagulating current, a second sonic warning device connected to the means for generating the coagulating current including means to produce a sound of a second and different selected frequency when the coagulating current is generated, means for generating an electrosurgical current, the last mentioned



means including both the means for generating the electrosurgical cutting current and the means for generating the electrosurgical coagulating current, both sonic warning devices being actuated when the blended current is generated, and means for supplying each of said currents to a patient.

3,929,138

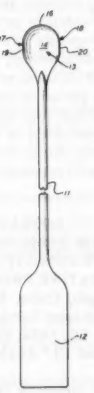
SUB-INTIMAL DISSECTOR AND METHODS FOR PERFORMING ENDARTERECTOMIES THEREWITH

Eli Curi, 3 Rail Court, Roseland, N.J. 07068

Filed July 18, 1973, Ser. No. 380,508

Int. Cl.² A61B *17/22*

U.S. Cl. 128—304 **8 Claims**



1. A sub-intimal dissector comprising:

a. an elongated shaft, the shaft being bendable and having shape memory,

b. a dissecting tip on one end of the shaft,

c. the tip being arcuate transverse to its longitudinal axis to define a concave top surface and a convex bottom surface extending between side edges,

d. a slightly forwardly convex leading edge on the tip smoothly merging with the said opposed side edges,

e. the opposed side edges tapering rearwardly and inwardly toward the shaft from a position slightly rearwardly of the leading edge,

f. the arcuately longest portion of the said convex bottom surface extending along an arc transverse to the longitudinal axis of the tip a distance equal to approximately one third to one fifth of the circumference of an artery upon which it is to be employed, and

g. the said leading edge in both said opposed side edges being smoothly rounded between the concave top and convex bottom surface of the tip.

6. A method for performing endarterectomies comprising:

a. incising an artery to expose the interface between the intima and the media,

intruding a dissecting tip intermediate the intima and the media at said exposed interface,

c. wedging the intima and media apart by passing the dissecting tip longitudinally along said interface for a distance from said incision while avoiding damaging the integrity of both the intima and media,

d. withdrawing the dissecting tip longitudinally to the incision,

e. reintruding the dissecting tip intermediate the intima and media and wedging the intima and media apart as aforesaid successively along paths contiguous to previous paths of movement of said tip for said distance until substantially the entire intima is wedged from the media along said distance, and

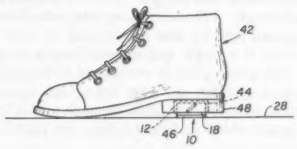
f. withdrawing the disengaged intima from the artery.

3,929,139

CORRECTIVE SHOE DEVICE

Nathan Salzman, 695 Willow Road, Franklin Square, N.Y. 11010

Filed Dec. 27, 1974, Ser. No. 536,727
Int. Cl.² A43B *7/24*
U.S. Cl. 128—583 **9 Claims**



1. A device for attachment to and rotation of a corrective shoe comprising first and second members,

one of said members being attached to a corrective shoe while the other of said members is free of the shoe,

means connecting said first and second members for relative reciprocable and rotative movements to rotate the shoe in response to the engagement of one of said members with the ground,

said connecting means including cam means on one of said members and follower means on the other of said members and guided by said cam means and means to urge said members to one relative position of reciprocation.

3,929,140

COMBINED HEEL POSITIONER AND ARCH SUPPORT FOR THE FOOT

Alex Wesberg, 615 N. Rexford Drive, Beverly Hills, Calif. 90210

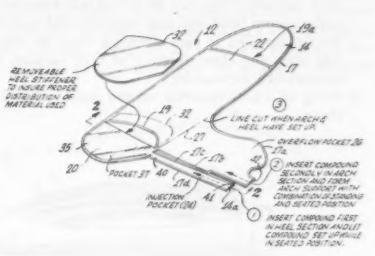
Filed Sept. 16, 1974, Ser. No. 506,392
Int. Cl.² A61F *5/14*
U.S. Cl. 128—595 **13 Claims**

1. An insert support envelope for support of a foot in a shoe, which comprises:

a discrete heel positioning and support chamber formed by at least a pair of superposed plastic sheets;

a discrete arch support chamber formed by a pair of superposed plastic sheets;

a weld line, constituted by the lamination of superposed plastic sheets, spacedly separating said discrete heel positioning support chamber from said discrete arch support chamber whereby pressure applied to said heel chamber is not transmitted to said arch chamber, and pressure applied to said arch chamber is not transmitted to said heel chamber;


REMOVABLE HEEL STIFFENER TO INSURE PROPER DISTRIBUTION OF MATERIAL COLD
LINE CUT WHEN ARCH & HEEL HAVE SET UP
OVERFLOW POCKET 26
INSERT COMPOUND SECONDLY IN ARCH SECTION AND FOAM ARCH SUPPORT WITH COMBINATION IN SEGMENT AND SEATED POSITION
INSERT COMPOUND FIRST IN HEEL SECTION AND LET COMPOUND SET UP FULL IN SEATED POSITION
POCKET 37
INJECTION POCKET (24)

a first inlet means communicating only with said heel positioning and support chamber for the purpose of injecting molding compound and allowing escape of trapped air; and

a second inlet means communicating only with said arch support chamber for the purpose of injecting molding compound and allowing escape of trapped air.

3,929,141

PROCESS FOR THE MANUFACTURE OF REGENERATED TOBACCO

Monique Beringer, St. Louis, France, and Paul Buchmann, Basel, Switzerland, assignors to Tamag Basel AG, Switzerland

Continuation of Ser. No. 337,475, March 2, 1973, abandoned. This application July 9, 1974, Ser. No. 486,837
Claims priority, application Luxemburg, Mar. 2, 1972, 64888
Int. Cl.² A24B *3/14*, *13/00*, *15/08*
U.S. Cl. 131—17 R **4 Claims**

1. A homogeneous regenerated tobacco of reduced nicotine content which consists of:

5,000 grams of filler consisting of: one or more of gramineous plants or shells of nuts, cocoa beans or coffee beans, 3,000 to 5,000 grams tobacco
600 grams magnesium formate
50 grams tartaric acid
300 grams potassium nitrate
1,000 grams paraffinurea
300 grams diammonium hydrogen phosphate
10 grams of vanillylideneurea
1,500 grams sodium carboxymethylcellulose
1,400 grams glycerine
150 grams diethylene glycol
1,050 grams fruit concentrate
600 grams raw molasses
105 grams malt extract.

3,929,142

HAIR VACUUM WITH STRIPPING CLASP

Edward M. Carfi, 210 Ramapo Valley Road, Oakland, N.J. 07436

Filed Oct. 3, 1974, Ser. No. 511,878
Int. Cl.² A45D *1/00*
U.S. Cl. 132—9 **2 Claims**

1. A hair vacuum with a stripping clasp comprising in combination:

a hollow base adapted to receive a vacuum source;

an elongated tubular vacuum head attached to said base and in communication with said vacuum source through said base and adapted to receive stripping attachment;

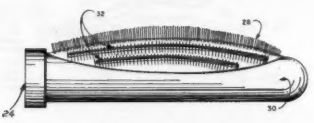
said vacuum head having at least one vacuum inlet aperature;

a handle attached to said base for manipulating said hair vacuum;

an elongated stripping clasp pivotally attached to said base such that said clasp may be moved into close proximity to said vacuum head and said vacuum inlet aperature;

a handle attached to said stripping clasp for manipulating said stripping clasp relative to said vacuum head in a scissors-like movement;

a lining of a soft material on the inside of said stripping clasp;



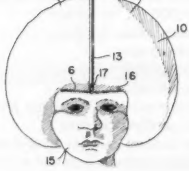
an elongated tubular stripping attachment for said vacuum head having a plurality vacuum inlet aperatures arranged to communicate with said vacuum head inlet aperature; said aperatures of said elongated tubular attachment fabricated of a soft, flexible material comprising triangular grooves transverse the longitudinal axis of said attachment wherein the cross-sectional profile of said grooves progressively increases from the inner longitudinal extremity of said attachment to the outer longitudinal extremity of said attachment.

3,929,143

COIFFURE HOOD

Arthur Coleman, San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 14, 1974, Ser. No. 497,206
Int. Cl.² A45D *6/00*
U.S. Cl. 132—36.1 R **1 Claim**



1. A coiffure hood for protecting the hair-do of a wearer which is formed of two half-sections of flexible material joinable by a slide fastener, said slide fastener protected from engaging the hair of the wearer by a flap of material, attached to one section which extends under the slide fastener, when worn, in which each half-section is fitted on its side with an external folding handle, with vent holes located in the top central portion of the hood for admission of heated air, said vent holes being covered by a removable flap of material held in place by snap fasteners, and with a side vent hole located in the side of each half-section adjacent the external handle, with

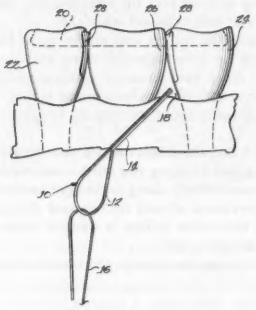
the half-sections and slide fastener formed so that the two half-sections form the two lateral sides of the assembled hood, with the slide fastener extending over the mid-section of the front, top and back of the assembled hood.

3,929,144

DEVICE FOR INSERTING DENTAL FLOSS THROUGH INTERPROXIMAL AREAS AND METHOD OF USING SAME

E. B. Tarrson, Chicago, Ill., and R. Young, Bowmanville, Canada, assignors to John O. Butler Company, Chicago, Ill.

Filed June 19, 1972, Ser. No. 264,171
Int. Cl.² A61C *15/00*
U.S. Cl. 132—93 **7 Claims**



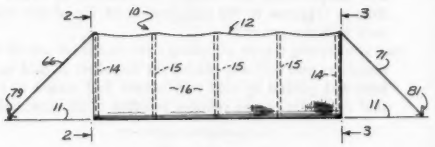
1. A preformed device for threading dental floss under or around bridges, said device comprising a closed looped portion formed from a single length of a relatively flexible filament material folded back on itself to form an elongated guide portion adjacent to and integral with said looped portion, the ends of said length of filament being integrally joined together in a juxtaposed side by side relationship to form said guide portion which is a single and integral length of said flexible material, said guide portion remaining substantially flexible but having a greater stiffness than said looped portion whereby said filament can slide through virtually any interproximal space which said dental floss can pass through.

3,929,145

COLLAPSIBLE SHELTER

Allen J. Schroeder, 1001 E. 12th St., Beaumont, Calif. 92223

Filed Feb. 14, 1975, Ser. No. 550,141
Int. Cl.² A45F *1/16*; E04B *1/347*
U.S. Cl. 135—1 R **10 Claims**



1. Collapsible shelter means comprising:

a flexible cover of relatively thin, weatherproof, lightweight sheet material adapted to assume a tubular shape when suitably stretched;

a plurality of normally hoop-shaped ribs formed from flat strip material in general conformity with the cross-sectional size and shape of said cover in its stretched, tubular form, said ribs being resiliently deformable under downwardly directed force when standing on edge;

fastening means for securing said ribs in positions adjacent said cover in generally coaxial relationship with, and in spaced apart relationship along the axis of, the cover in its stretched, tubular form, the spacing of the secured ribs being such as to permit them to serve as frame means for the stretched cover; and

removably installable anchoring means for exerting oppositely and downwardly directed pulling force on the upper center portions of the two end ones of said ribs to stretch the rib-reinforced cover into the form of a tubular shelter, and help cause flattening distortion of said shelter to increase its width, on a substantially horizontal support surface;

said shelter means being axially contractable, when free of the pulling influence of the anchoring means, into a compact, lightweight bundle, for easy portability.

3,929,146

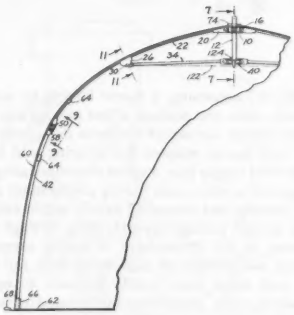
UMBRELLA TENT

Francis H. Maiken, Keasey Rte., Box 134, Vernonia, Oreg. 97064

Filed Oct. 18, 1973, Ser. No. 407,553

Int. Cl.² A45F *1/04*

U.S. Cl. 135—2 **10 Claims**



1. An umbrella tent comprising

a. a framework including

1. an imperforate top base member including a flange portion and a vertical post portion extending downward from the flange portion,
2. a plurality of elongated resilient ribs pivoted at their upper ends to the flange portion of the top base member at peripherally spaced positions for movement between extended and retracted positions,
3. a plurality of braces connected pivotally at their outer ends one to each of the ribs intermediate the ends of the latter,
4. a hub pivotally interconnecting the inner ends of the braces and positioned vertically below the top base member for vertical movement toward and away from the latter across the plane extending through the pivot connections of the braces to the ribs, to move the ribs between said extended and retracted positions, and
5. abutment means on the top base member and hub interengageable when the hub moves upward across said plane to limit said upward movement, and

b. flexible cover material supported by the framework and dimensioned to become stretched as the ribs move toward extended position, whereby to maintain the abutment means resiliently in interengagement and the tent in erected condition.

3,929,147

COLLAPSIBLE SHELTERS

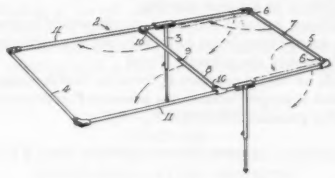
Edward J. Roscoe, 3 Chesterfield House, High Level Road, Green Point Cape Province, South Africa

Filed Feb. 4, 1974, Ser. No. 439,086

Int. Cl.² E04F *10/10*

U.S. Cl. 135—7.1 A **11 Claims**

1. A collapsible shelter frame comprising, in an erected condition, at least four elongated frame members arranged to define the sides of a polygon having at least four sides, at least two of said members being generally parallel, said at least four members being hingedly interconnected together, one of said parallel members comprising a pair of member sections interconnected together by a releasable joint intermediate the ends of said one member, the other of said parallel members being rigid throughout its length, the remaining two frame members of said at least four members each including a pair of remaining member sections; a pair of leg members extending outwardly of the plane of the frame and being hingedly connected



to said remaining frame members by means of hinge assemblies designed to permit said sections of said respective remaining members to be releasably aligned in coaxial relationship with one another, whereby the frame may be collapsed into a compact unit upon release of said one member sections, upon movement of said one member sections to respectively lie against said remaining members, upon movement of said remaining member sections into contact with their respective leg members, and upon movement of said remaining frame members together with said hinged sections to lie against said other parallel member.

3,929,148

DIFFERENTIAL AND PROPORTIONAL PNEUMATIC AMPLIFIERS

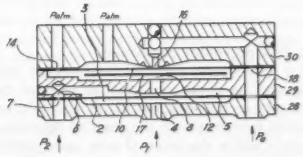
Michel Midy, Pavillon-sous-Bois, France, assignor to Materiel Electrique de Controle et Industriel, Paris, France

Continuation of Ser. No. 331,952, Feb. 12, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,781

Claims priority, application France, Feb. 14, 1972, 72.04825

Int. Cl.² G05D *16/06*

U.S. Cl. 137—84 **12 Claims**



1. A differential and proportional amplifier comprising:

a first stage chamber divided by a first membrane into a first compartment and a second compartment,

the first compartment having a pressure input and the second compartment having a pressure input,

the pressure input of the first compartment being directly connected to a pressure source providing a pressure P_1, the pressure input of the second compartment being connected by a pneumatic resistance to a pressure source providing a pressure P_2, the second compartment having an outlet opening which is closable by the first membrane under the influence of the pressure P_1, the outlet opening of the second compartment providing a flow Q proportional to the pressure difference $P_2 - P_1$, and

a second stage chamber divided by a second membrane into a third compartment and a fourth compartment,

the third compartment having an input connected only to the outlet opening of the second compartment for receiving the flow Q, the third compartment also having a separate output channel connected only to the atmosphere through a penumatic resistance, such that in the third compartment there prevails a pressure P proportional to the flow Q and thus to the pressure difference $P_2 - P_1$,

the fourth compartment being at atmospheric pressure and including an exhaust opening,

the exhaust opening forming a nozzle which is closable by the second membrane to thereby act as a baffle under the influence of the pressure P and

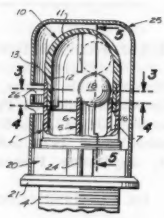
provide an output pressure P_2 from the fourth compartment which is proportional to the pressure P and consequently to the pressure difference $P_2 - P_1$.

3,929,149

BACKFLOW PREVENTOR FOR AUTOMATIC DISHWASHERS

Wendell Phillips, Bloomington, Calif., assignor to Robert Manufacturing Company, Cucamonga, Calif.

Filed May 23, 1974, Ser. No. 472,624
Int. Cl.² F16K *24/00*
U.S. Cl. 137—216 **4 Claims**



1. A back flow preventor comprising:

a. a tubular shell having a circular open upper end, a vent opening near its upper end, and an internal essentially disposed tube terminating approximately at the upper end of the shell to define with the shell an opening equal to the passage within the internal tube and forming an upwardly directed valve seat, the internal tube and shell forming respectively an inlet duct and an outlet duct;

b. a cap member having a closed upper end and a tubular lower portion dimensioned for reception into the upper end of the shell around the inner tube whereby the internal tube discharges upwardly into the cap member for downward discharge into the surrounding shell;

c. said cap member also having an internal valve guide channel aligned with the valve seat and an external channel forming with the shell an upwardly directed vent passage to the vent opening; whereby, in the event of suction pressure within the shell, air may be drawn through the vent opening;

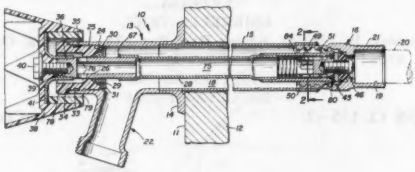
d. and a ball valve engageable with the internal tube valve seat and movable upwardly therefrom in the guide channel for discharge from the internal tube into the cap member and deflection into the shell.

3,929,150

SILLCOCK INCORPORATING AN ANTISIPHON AND BACKFLOW PREVENTER

Vaughn D. Flinner, Big Prairie, and Richard W. Sprang, Lakeville, both of Ohio, assignors to Mansfield Sanitary Inc., Perrysville, Ohio

Filed Oct. 9, 1974, Ser. No. 513,339
Int. Cl.² F16K *24/02*
U.S. Cl. 137—218 **8 Claims**



1. A sillcock comprising; a barrel having an axially inner and an axially outer end portion; a first passageway extending through said barrel; connector means at the axially inner end portion of said barrel adapted for securing said barrel to a pressurized fluid supply line; a spout communicating with said first passageway; a valve stem having axially inner and axially outer end portions and extending axially within said first passageway; a second passageway extending through said valve stem opening to the atmosphere; a handle secured to the axially outer end portion of said valve stem for selectively displacing said valve stem axially between an open and a closed position while permitting said second passageway to communicate to the atmosphere; a valve seat circumscribing said first passageway within said barrel and disposed between said connector means and said spout; a piston mounted within the axially inner end portion of said valve stem so as to be movable axially between a retracted and protracted position with respect to said valve stem; a valving element mounted on said piston in opposition to said valve seat; means on said valve stem to engage said piston in its retracted position and maintain said valve element in sealing engagement with said valve seat when said valve stem is in closed position; and, biasing means acting between said valve stem and said piston continuously to urge said piston toward its protracted position to maintain said valve element in sealing engagement with said valve seat throughout the range of axial movement available to said valve stem between said open and closed positions when the pressure within said fluid supply line falls below a predetermined value thereby preventing backflow and simultaneously permiting communication between said first passageway and said second passageway to release backpressure present to the atmosphere through said second passageway.

3,929,151

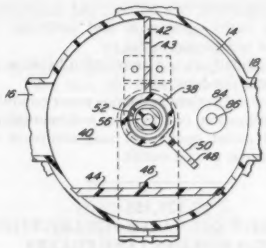
MIXING APPARATUS

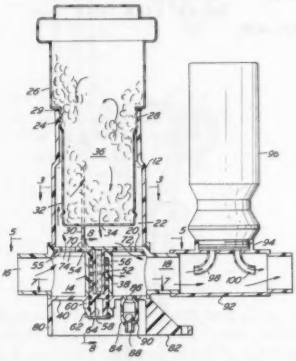
Harry S. Rubin, 7847 Williams Ave., Philadelphia, Pa. 19150

Filed Mar. 6, 1974, Ser. No. 448,778
Int. Cl.² B01D *11/00*; B01F *1/00*
U.S. Cl. 137—268 **18 Claims**

1. Apparatus comprising a housing means having primary and secondary flow paths communicating with an inlet and an outlet, said housing means including selectively adjustable valve means for controlling flow between said flow paths, a movable flow restrictor in said primary flow path, and means on said housing for automatically correlating the range of movement of said flow restrictor with said valve means so that the range of movement of said flow restrictor is at a minimum when said valve means is fully opened and vice versa, a fixed limit stop on said housing means, spring means biasing said

flow restrictor towards said limit stop so that there is minimum flow through the primary flow path, and another limit stop on





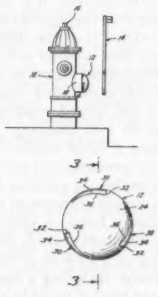
a movable portion of said valve means for defining the range of movement of said flow restrictor.

3,929,152

FIRE HYDRANT CAP AND ACTUATING TOOL THEREFOR

Gerald A. Graham, 9721 Kempwood Drive, Apt. 1405, Houston, Tex. 77055

Filed July 10, 1974, Ser. No. 486,975
Int. Cl.² E03B 9/02
U.S. Cl. 137—296 **8 Claims**



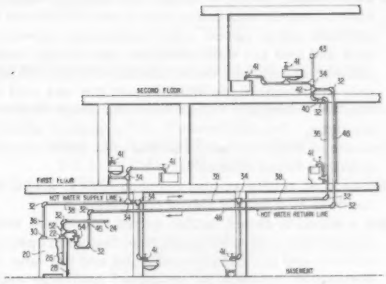
1. A fire hydrant cap comprising,
a body having first and second ends,
said first end having internal threads extending inwardly into the body for attachment to a fire hydrant,
said second end extending from the first end and having a curved convex shape,
a plurality of tool engaging surfaces spaced from each other and positioned on the second end, each engaging surface including a shoulder facing oppositely to the direction in which the cap is threaded onto a hydrant for providing shoulders for engaging a tool for connecting the cap to a hydrant,
each engaging surface including a recess extending from said shoulder in a direction opposite to the direction in which the cap is threaded onto the hydrant, said recess including a curved surface progressively increasing in distance from the axis of the body and includes a sidewall which extends parallel to the longitudinal axis of said cap for coacting with a tool for unthreading the cap from a hydrant.

3,929,153

GRAVITY HOT WATER CIRCULATING SYSTEM AND FLOW REGULATOR THEREFOR

William E. Hasty, 14038 Peyton Drive, Apt. 117, Dallas, Tex. 75240

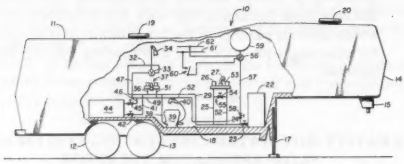
Continuation of Ser. No. 386,548, Aug. 8, 1973, abandoned.
This application Mar. 11, 1975, Ser. No. 557,361
Int. Cl.² E03B 11/06
U.S. Cl. 137—337 **6 Claims**



1. A system for maintaining heated water at one or more fixtures, said system comprising:
a. fixture means,
b. water heater means having an inlet for introducing cold water to be heated to said water heater means and an outlet, said outlet being connected by piping to said fixture means for supplying heated water to said fixture means, said fixture means being further connected by piping to said inlet for returning heated water to said inlet, at least a portion of said return piping being graded with respect to the horizontal to facilitate movement of said heated water in the vertical direction and to permit any air present in said return piping to easily rise to the highest point in the system to thereby insure the required circulation of said heated water in said return piping,
c. air vent means connected to said return piping at said highest point for permitting said air to be dispelled from said system; and
d. flow regulating means connected between said fixture means and said cold water inlet, said flow regulating means having a valve head which is closed by gravity during the absence of circulating heated water in said return piping and during the introduction of cold water at said inlet to thereby prevent said cold water from entering said return piping and disrupting said circulation, and said valve head being opened in response to pressure exerted adjacent said valve head by the circulating heated water in said return piping between said fixture means and said flow regulating means to thereby permit the return of

heated water to said cold water inlet and maintain heated water at said fixture means.

3,929,154
FREEZE PROTECTION APPARATUS
Frank E. Goodwin, 1015 N. 23rd St., Billings, Mont. 59101
Filed July 29, 1974, Ser. No. 492,492
Int. Cl.² E03B 9/14
U.S. Cl. 137—344 **7 Claims**



1. In combination with a structure having a plurality of water conduits leading to various regions of utilization, at each of which regions there is a valved outlet from one of said water conduits, some of said conduits acting as hot water conduits and other of said conduits acting as cold water conduits;

a water heater having a storage tank with a valved drain outlet, a valved inlet connection to one of said cold water conduits and a valved outlet connection between said tank and said hot water conduits, said storage tank and said valved inlet and outlet connections constituting the only interconnections between said hot and cold water conduits when said valved inlet and outlet connections are open,

a source of water connected to said cold water conduits by a further valved connection,

a source of antifreeze also connected to said cold water conduits by a further valved connection,

and a normally closed further valved connection between said hot and cold water conduits so that upon opening the valve in said last named connection and the valve in the connection between the source of antifreeze and said cold water conduits, following closure of the valves in the connection to the source of water and in the inlet and outlet connections of said heater storage tank and draining of the latter, antifreeze can be admitted to both said cold and hot water conduits while leaving said heater storage tank substantially free of fluid of any kind.

6. The method of winterizing a structure having a plurality of water conduits leading to various regions of utilization, at each of which regions there is a valved outlet from one of said water conduits, some of said conduits acting as hot water conduits and other of said conduits acting as cold water conduits, a water heater having a storage tank with a valved drain outlet, a valved inlet connection to one of said cold water conduits and a valved outlet connection between said tank and said hot water conduits, said storage tank and said valved inlet and outlet connections constituting the only interconnections between said hot and cold water conduits when said valved inlet and outlet connections are open, and a source of water connected to said cold water conduits by a valved connection, said method comprising:

providing a normally closed connection between said hot and cold water conduits,

closing off the connections between said source of water and said cold water conduits,

opening the valved outlets at each of said points of utilization and opening said drain outlet of said heater storage tank to drain substantially all of the water from said storage tank and said conduits,

closing the inlet and outlet connections of said heater storage tank and the valved outlets at the regions of utilization,

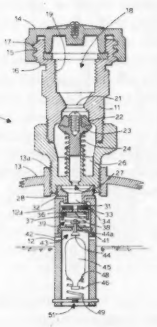
supplying an antifreeze solution under pressure to said cold water conduits,

opening said valved outlets in the cold water conduits at the regions of utilization, one by one, and maintaining each such valved outlet open until said antifreeze solution starts to flow out of said outlet,

opening said normally closed connection between said hot and cold water conduits, and

opening said valved outlets in the hot water conduits at the regions of utilization, one by one, and maintaining each such valved outlet open until said antifreeze solution starts to flow out of said outlet.

3,929,155
FLOAT SHUT OFF VALVE FOR LIQUEFIED PETROLEUM GAS TANK FILLERS
Owen L. Garretson, P.O. Box 108, Farmington, N. Mex. 87401
Continuation of Ser. No. 288,132, Sept. 11, 1975, abandoned.
This application Sept. 3, 1974, Ser. No. 502,612
Int. Cl.² F16K 31/18
U.S. Cl. 137—430 **10 Claims**



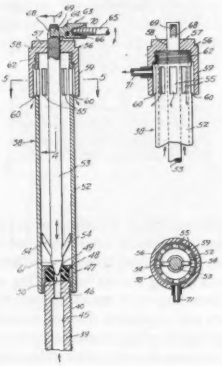
1. A liquefied petroleum gas tank filler valve assembly, comprising a filler valve body having a flow passage extending therethrough from a filler mouth, a check valve in said flow passage, attachment means on the exterior of said body for sealingly securing said body vertically in an opening in the top of a liquefied petroleum gas tank which is normally vertical during filling, means defining a housing of relatively reduced diameter extending from said body adjacent said attachment means such that said housing will pass freely through an opening in which said attachment means secures said body and thus extend downwardly into the interior of a tank, said body and said housing being rigidly secured together so as to be mountable as an integral unit on and in a tank, discharge port means communicating with said flow passage and opening from the assembly below said attachment means so as to open into a tank in which the assembly is mounted, shut-off valve means movable between open and closed positions for controlling flow from said passage to said discharge port means, said shut-off valve comprising a valve closure member movable between open and closed positions and having opposed pressure surfaces, spring means having a closing force for normally maintaining said valve closure member in its closed position except when a net pressure force on said opposed pressure surfaces in an opening direction exceeds the closing force of said spring during filling of a tank in which the assembly is mounted, automatic means, including a float carried by said housing, responsive to the level of liquid in a tank in which the assembly is mounted for reducing said net pressure force to a value less than the closing force of said spring when such liquid level reaches a predetermined level, and override means responsive to the orientation of the assembly for causing said automatic means to reduce said net pressure force as aforesaid

when the assembly is oriented beyond a predetermined amount from the vertical, regardless of the liquid level in a tank in which the device is mounted.

3,929,156
FLOAT VALVE

Pasquale P. Pariso, 222 Bloomer Ave., Elmira, N.Y. 14901

Filed Nov. 20, 1973, Ser. No. 417,517
Int. Cl.[2] F16K *31/24*
U.S. Cl. 137—444 **1 Claim**



1. In a float valve for a water closet tank of the type including a bottom wall having an opening therein, said float valve comprising a vertically disposed generally cylindrical hollow shank extending through the opening in said bottom wall and having a fluid passageway therethrough, a fitting detachably secured on the upper end of said shank, a bushing mounted in said fitting and having a fluid passageway therethrough communicating with the fluid passageway in said shank and having at its upper end a seat, a hollow valve body having said fitting in the lower end thereof, said valve body having a plurality of spaced parallel window slots in the upper portion thereof, a body member mounted on the upper end of said valve body, said body member having a cylindrical skirt spaced outwardly from the window slots providing a space for fluid to pass therethrough into said tank, said body member having an opening in the top thereof, a vertically disposed vertically moveable valve rod extending through the opening in said body member and through said valve body, a conically tapered valve element on the lower end of said valve rod adapted for movement into and out of open and closed relation with respect to the seat in said bushing, and a pair of guide prongs projecting integrally outwardly of opposite sides of said valve rod and sloping in a direction away from said valve element to guide the movement of said valve element into and out of engagement with said seat.

3,929,157
FLUID FLOW REGULATOR

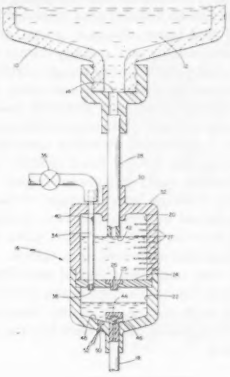
Juan R. Serur, 34A Harvard Ave., Brookline, Mass. 02146

Filed June 17, 1974, Ser. No. 479,762
Int. Cl.[3] A61M *5/00*
U.S. Cl. 137—453 **10 Claims**

1. A rate of flow regulator for use in a gravity assisted fluid delivery system, the regulator comprising

a first upper fluid chamber having a fluid inlet, fluid outlet means, and means for maintaining a predetermined level of fluid in said upper chamber;

a second lower fluid chamber having an inlet lower than said outlet means and disposed to gravitationally receive all fluid from said upper fluid chamber outlet means and having a fluid outlet; and

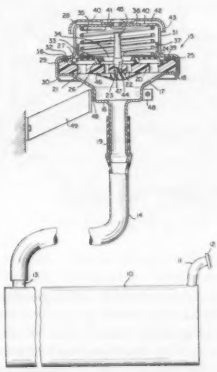


vent means for establishing uninterrupted communication between each said chamber and the atmosphere exterior of the regulator.

3,929,158
REMOTE PRESSURE-VACUUM RELIEF VALVE ASSEMBLY

Robert E. Rodgers, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed July 3, 1974, Ser. No. 485,350
Int. Cl.[2] G05D *27/00*; F16K *17/04*
U.S. Cl. 137—493.9 **7 Claims**



1. A safety pressure-vacuum relief assembly for vehicle fuel tanks and the like comprising a tubular fitting having an upwardly flared upper end and a reduced lower end, a substantially flat flange circumscribing said upper end and disposed in a plane substantially perpendicular to the axis of said fitting, a substantially flat plastic plate resting on and peripherally substantially congruent with said flange, a plurality of openings through said plate, each of said openings being disposed at at least a first radial distance from the center of said plate, at least one aperture through said plate at a radial distance from said plate center less than said first distance, an inverted cup having a peripheral skirt and a reduced, upwardly-extend-

ing base defining an annular shoulder, said skirt encompassing said flange and being deformed to hold said fitting and said cup against axial separation, an annular, flexible gasket having an outer peripheral bead gripped between said plate and said shoulder and an inner peripheral bead engaging the upper flat surface of said plate in an annular area disposed between said first distance and said lesser distance, a seal plate having a central aperture and bearing on a radially inward region of the upper surface of said gasket, spring means confined between the floor of said cup base and said seal plate to urge said gasket inner peripheral bead into yieldable sealing contact with the upper surface of said plate to provide a pressure relief valve for the tank, a rubberoid umbrella valve having a stem centrally penetrating and axially fixed relative to said plate and having its flexible outer peripheral region normally in sealing engagement with the lower surface of said plate in an annular region disposed between said first distance and said lesser distance to provide a vacuum relief valve for the tank, means for mounting said assembly on a vehicle, and conduit means for connecting said lower end of said fitting with the interior of a fuel tank for such a vehicle at a point remote from the filler neck of such a tank, said cup base having ports therein to provide communication between the cup interior and the atmosphere.

3,929,159

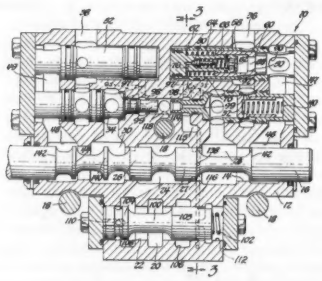
POWER TRANSMISSION

Dennis J. McAvoy, Lake Orion, Mich., assignor to Sperry Rand Corporation, Troy, Mich.

Filed Feb. 10, 1975, Ser. No. 548,476

Int. Cl.² F15B *13/04*

U.S. Cl. 137—596.18 **2 Claims**



1. A directional valve assembly for hydraulic power systems comprising a body having a sliding spool of the closed center type arranged to selectively direct inlet fluid to either of two motor ports, load holding check valves between the spool and each motor port, combined counter balance and relief check valves one connected between each motor port and a return port and each having a control piston exposed through a restriction to its respective motor port pressure, pilot valves for relieving the pressures on the respective control pistons at a pre-determined pressure level, and secondary pilot valves each responsive to operating pressure upstream from the load holding check valve for the opposite motor port, whereby each pilot valve controls one check valve to open it, either for limiting maximum pressure in its own motor port or in response to operating pressure at an opposite motor port and means controlled by the spool for directing inlet pressure to both secondary pilot valves at the same time for opening both counterbalance and relief check valves to bypass both motor ports to tank around the load holding check valves.

3,929,160

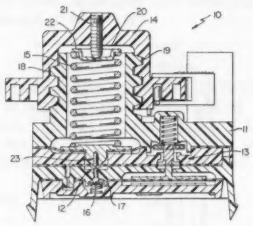
DIFFERENTIAL PRESSURE OPERATED PILOT RELAY AND SYSTEM AND DIVERTING RELAY CONSTRUCTION UTILIZING THE SAME OR THE LIKE

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 405,132, Oct. 10, 1973. This application Feb. 21, 1975, Ser. No. 551,624

Int. Cl.² G05D *23/00*

U.S. Cl. 137—625.5 **40 Claims**



1. A pneumatically operated diverting relay construction comprising a differential pressure operated pilot relay means and a diverting valve means operatively associated together, said pilot relay means having means for sending a pneumatic pilot output to said diverting valve means to switch said diverting valve means from one condition thereof to another condition thereof when said pilot relay means receives a pneumatic signal of a certain magnitude, said pilot relay means having pneumatic means for selecting within limits the magnitude of said pneumatic signal that is required for said pilot relay means to produce said pneumatic pilot output for switching said diverting valve means from said one condition thereof to said other condition thereof, said pilot relay means having means for terminating said pneumatic pilot output to cause said diverting valve means to switch from said other condition thereof to said one condition thereof when said pneumatic signal falls to another certain magnitude, the last named means causing said other certain magnitude to be a fixed differential from said selected magnitude thereof.

3,929,161

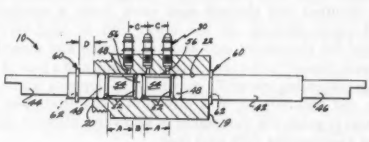
SPOOL VALVE FOR MULTIPLE ADJUSTABLE SYSTEMS

Wallace G. Boelkins, Grand Rapids, Mich., assignor to Uni-Mist, Inc., Grand Rapids, Mich.

Filed Aug. 22, 1973, Ser. No. 390,569

Int. Cl.² F16K *11/07, 11/18*

U.S. Cl. 137—625.69 **8 Claims**



1. In a spool valve including a valve body having a passageway therethrough, an elongated spool shaft rotatably, axially movably, and coaxially received in said passageway, a plurality of ports communicating with said passageway, and means on said spool shaft providing a fluid seal for said shaft in said passageway and for selectively interconnecting certain of such ports for fluid communication in response to axial movement of said shaft; the improvement comprising said spool shaft having a length sufficient to protrude at both its ends beyond said body; said spool shaft further including rotatable drive connection means on at least one of its said protruding ends for rotatable drive connection of said shaft to a rotatably

variable device such that shaft rotation is transmitted to such device, whereby axial movement of said spool may actuate said valve while rotational movement of the spool varies said device; and including removable abutment means on said spool shaft external of said valve body and adjacent to parts of said body for limiting the axial movement of said shaft and for selective disassembly of said shaft from said body.

3,929,162

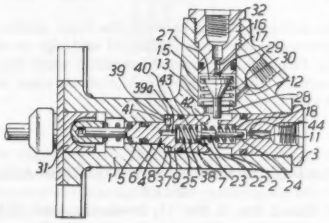
MASTER CYLINDER ASSEMBLIES FOR HYDRAULIC SYSTEMS

Robin Adam Cochrane, Haseley Knob, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 215,848, Jan. 6, 1972, abandoned. This application Aug. 10, 1973, Ser. No. 387,258

Int. Cl.² F16K *11/16*

U.S. Cl. 137—627.5 **3 Claims**



1. A master cylinder assembly comprising a housing having a cylindrical bore, a recuperation port, an inlet, and an outlet, a piston assembly working in said bore and movable therein in response to a positive applying force, a normally closed tilting valve for controlling communication between said inlet and said outlet and operated by said piston assembly, and a normally open recuperation valve for controlling communication between a pressure space in the bore in advance of said piston assembly and said recuperation port, said recuperation valve comprising a seating surrounding said port, an axially movable valve member for engagement with said seating a resilient connection between said axially movable valve member and said piston assembly so constructed and arranged that when said piston assembly is advanced in said bore initial axial movement thereof causes said axially movable valve member to engage with said seating to cut-off communication between said port and said outlet before further axial movement of said piston assembly opens said normally closed valve, wherein said bore is of stepped outline having a first bore portion of smaller diameter and a second bore portion of greater diameter, and said piston assembly is of stepped outline having a first portion of smaller diameter working in said first bore portion, and a second portion of greater diameter working in said second bore portion which also defines said pressure space, the piston assembly being provided with restricted passage means providing communication at all times between said pressure space and a chamber defined in said bore between steps at the changes in diameter between said first and second bore portions and said first and second portions of said piston assembly.

3,929,163

PRESSURE VESSEL WITH SENSING DEVICE

Otmar Schön, Scheidterberg, Germany, assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

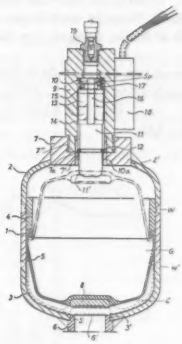
Filed July 10, 1974, Ser. No. 486,945

Claims priority, application Germany, July 20, 1973, 2336965

Int. Cl.² F16L *55/04*

U.S. Cl. 138—30 **5 Claims**

1. A pressure vessel comprising a rigid container having a gas port and an oil port and a flexible partition intervening between said ports and defining a gas chamber and a liquid chamber, a magnetic switch positioned exteriorly of said container, a permanent magnet slidably mounted on said container, means protruding into said gas chamber operatively connected to said permanent magnet to move the latter, said



means being in the path of movement of said flexible partition, said magnetic switch being substantially aligned with said permanent magnet to be actuated upon movement of the latter when the volume of gas in said gas chamber has fallen below a predetermined amount.

3,929,164

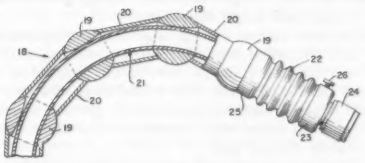
FLUID TRANSFER UMBILICAL ASSEMBLY FOR USE IN ZERO GRAVITY ENVIRONMENT

Harold J. Richter, Rte. 3, Box 55, Evergreen, Colo. 80439

Division of Ser. No. 118,694, Feb. 25, 1971, abandoned. This application Sept. 8, 1972, Ser. No. 287,342

Int. Cl. F16l *11/12*

U.S. Cl. 138—120 **1 Claim**



1. A fluid transfer umbilical assembly for use in a zero gravity environment comprising, hose means, means positioned within and operatively connected to said hose means for containing the end forces developed during pressurization of the umbilical, thereby preventing longitudinal growth of the umbilical, whereby the umbilical is maintained flexible to facilitate the maneuverability of an astronaut to whom the line is attached; a plurality of spherical members and tubular sockets alternately positioned on the hose means and slidably supported thereon, a bellows having one end fixedly mounted on the umbilical supply line, the opposite end of the bellows being slidably mounted on the umbilical supply line and adjacent one of the spherical members, and valve means connected to the bellows for controlling the flow of pressurized fluid from the umbilical supply line to the bellows, whereby when the valve means is opened pressurized fluid is allowed to flow into the bellows thereby expanding the bellows to slide said opposite end of the bellows axially toward said one spherical member which, in turn, transmits the rigidifying force to the remaining spherical members and tubular sockets, whereby the hose means may be selectively rigidified to

thereby maintain the umbilical assembly at a fixed attitude once a desired position at a work station has been attained.

3,929,165

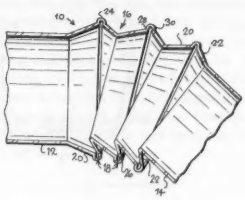
TUBULAR HINGE ASSEMBLY

Edwin J. Diebolt, Muncie, and Roger A. Hendrickson, Indianapolis, both of India, assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 207,069, Dec. 13, 1971, abandoned. This application Oct. 17, 1974, Ser. No. 515,459

Int. Cl.² F16L *11/06*

U.S. Cl. 138—121 **6 Claims**



1. A tubular hinge assembly having relatively thick walls for inclusion between two ends of a relatively thick-walled conduit so as to permit the ends of the conduit to be moved with respect to one another between a plurality of stable positions, said hinge assembly comprising:

a first hollow frusto-conical wall section having a major diameter at one end, a minor diameter at its other end; a first wall length dimension, and a wall thickness in excess of about 0.008 inch;

a second hollow frusto-conical wall section having a major diameter at one end, a minor diameter at its other end, a second wall length dimension, and a wall thickness in excess of about 0.008 inch;

said major diameters being substantially equal;

said minor diameters being substantially equal;

said first wall length dimension being greater than said second wall length dimension;

an annular, hollow, beaded hinge element disposed between and circumferentially connecting said major diameters and defining a hollow, annular circumferential channel on the radially inner side of said hinge element;

said hinge element having a curved, partially closed cross-sectional shape with a center of curvature located inwardly thereof; and

at least one of said wall sections being movable about an imaginary annular axis substantially within the hollow annular structure of said hinge element between at least two alternate stable positions;

said annular, hollow, beaded hinge element thereby facilitating the positioning of the conduit ends with respect to each other between a plurality of stable positions by defining and providing said annular axis and, at the same time, providing space in the hollow portion thereof for receiving at least part of the thickness of the movable wall section when in at least one of its stable positions.

3,929,166

PIPELINE THERMAL INSULATION

Robert J. Westerheid, Seabrook, Tex., assignor to General Electric Company, Fairfield, Conn.

Filed Aug. 9, 1973, Ser. No. 387,206

Int. Cl.² F16L *9/14, 9/22*

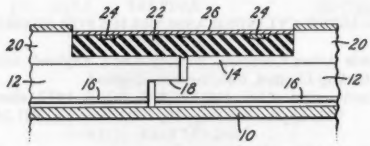
U.S. Cl. 138—149 **4 Claims**

1. Improved insulation for application to a pipe carrying hot fluids in an environment which is cool relative to the fluids comprising:

preformed foamed insulation in a longitudinal section forming a segment of an annulus;

said annulus having an inner diameter sufficiently larger than the outer diameter of the pipe to permit free relative axial movement between the pipe and the insulation;

a segmented sheet metal cover to which said insulation is bonded; and



friction reducing means between the inner surface of said segment and the outer surface of said pipe to eliminate shear forces in the foamed insulation when the relative movement occurs, whereby friction between said pipe and said segment is reduced.

3,929,167

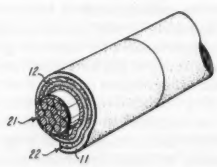
INSULATION DEVICE FOR PROTECTION AGAINST HEAT

Bruce T. Bickel, Rte. 3, Box 21, Brookville, Ohio 45309

Filed Oct. 29, 1974, Ser. No. 518,504

Int. Cl.² F16L *59/02, 9/14*

U.S. Cl. 138—151 **18 Claims**



1. An insulating device comprising a plurality of layers of insulation material, said layers of insulation material comprising a minimum of one layer of multi air cell non combustible material consisting of high temperature electronic needled fiberglass or ceramic fiber and one layer of high temperature asbestos mill board with any additional layers comprising layers of said multi air cell non combustible material and asbestos mill board configured in an alternating sequence, said layers of said multi air cell non combustible material and said asbestos mill board further configured in a variable number of layers and thicknesses per layer to provide insulation protection in conformance with a varying range of high temperatures.

3,929,168

TAKE-OFF REGULATOR

Walther Filter, Langenhagen, and Claus Filter, Rethem, Aller, both of Germany, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed Jan. 25, 1974, Ser. No. 436,456

Claims priority, application Austria, Feb. 8, 1973, 1150/73

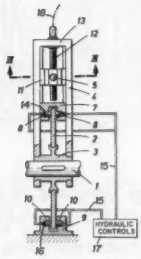
Int. Cl.² D03D *49/06, 49/20*

U.S. Cl. 139—99 **4 Claims**

1. A weaving machine comprising:

a. a shaft having an axis and mounted for angular movement about said axis;

b. a cloth take-up mechanism and a warp let-off mechanism, one of said mechanisms being drivingly connected to said shaft for control of said one mechanism by said shaft;
c. a disc member secured to said shaft for joint angular movement about said axis and having two radial faces;
d. an operating member mounted for pivoting movement about said axis relative to said disc member;
e. actuating means for alternatively pivoting said operating member forward and backward about said axis;



f. first clamping jaw means mounted on said operating member and engageable with said radial faces for coupling said disc member to said operating member for joint angular movement;
g. second clamping jaw means engageable with said radial faces for preventing angular movement of said disc member; and
h. control means for alternatively operating said first and second jaw means during standstill of said operating member between forward and backward pivoting movements of the operating member and for thereby rotating said shaft in steps.

3,929,169

THREAD BRAKE

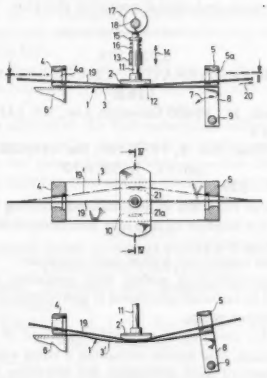
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 2, 1974, Ser. No. 457,235

Claims priority, application Switzerland, Apr. 3, 1973, 4723/73

Int. Cl.² D03D *47/34*

U.S. Cl. 139—122 H **10 Claims**



1. A thread brake comprising a pair of brake members for movement against each other for braking a thread passing longitudinally therebetween in a predetermined path, each brake member having a smooth braking surface opposite each other to define said path therebetween, and an indentation in at least one of said braking surfaces disposed in a laterally spaced parallel plane to said path, said indentation being sized to receive a braked thread therein to retain the thread within the limits of said brake members.

3,929,170

METHOD AND APPARATUS FOR MOVING A KNITTING NEEDLE OR THE LIKE OF A SHUTTLELESS LOOM

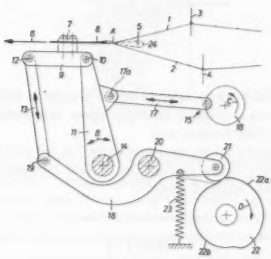
Jakob Müller, Frick, Switzerland, assignor to Ingenieurburo fur Maschinebau Jakob Müller, Frick, Switzerland

Filed Jan. 21, 1974, Ser. No. 434,991

Claims priority, application Switzerland, Jan. 24, 1973, 984/73

Int. Cl.² D03D *47/42*

U.S. Cl. 139—124 A **10 Claims**



1. An apparatus for moving a knitting needle having a hook of a shuttleless loom, said apparatus comprising at least two drive mechanisms for imparting movement to the knitting needle, each of said drive mechanisms being adjutable independently of the remaining drive mechanisms for changing the movement imparted by it to the knitting needle, the hook of the knitting needle being movable by means of a first drive mechanism essentially in the direction of the selvage of the woven article and by means of a second drive mechanism in a direction which is essentially perpendicular to such selvage, said first and second drive mechanisms being constituted by said at least two drive mechanisms, said first drive mechanism including a lever, a stationary shaft, said lever being rotatably mounted about said stationary shaft, and first drive means connected to said lever for moving said lever to-and-fro between two positions, a coupler having means for carrying the knitting needle, said lever being hingedly connected with said coupler adjacent one end of said coupler, said second drive mechanism including a substantially rod-shaped connection element connected with said coupler adjacent an opposite end thereof, second drive means connected to said connection element for moving said connection element to-and-fro between two positions in its lengthwise direction to thereby pivot said coupler about its hinged connection with said lever.

3,929,171

FAIL SAFE STOP MOTION FOR LOOMS

Umberto V. Tosti, Milford, and Richard L. Childs, Mendon, both of Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

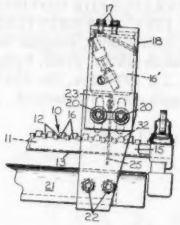
Filed Nov. 27, 1974, Ser. No. 527,597

Int. Cl.² D03D *51/00, 51/20*

U.S. Cl. 139—336 **3 Claims**

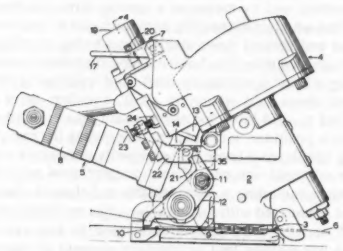
1. A fail safe operating system for looms having a mechanical warp stop motion of the sliding feeler bar type for effecting stoppage of loom operation upon breakage of a warp yarn and the release of a drop wire suspended thereby to the sliding feeler bar, said system comprising:

a. drive means for operating the loom;
b. circuit means operably connected to a source of electricity and to said drive means for effecting operation thereof;
c. solenoid means connected to said circuit means, said solenoid means having a reciprocable armature held in a



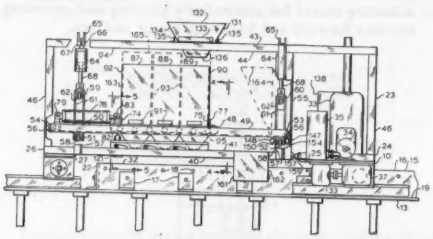
first position when said solenoid means is energized and movable to a second position upon the deenergizing of said solenoid means; and
d. means operated by said armature for actuating the warp stop motion upon movement of said reciprocable armature to said second position.

3,929,172
PACKAGE STRAPPING TOOL
Robert David Sansum, Harpenden, England, assignor to Gerrard Industries Limited, Rotherham, England
Filed June 5, 1974, Ser. No. 476,446
Claims priority, application United Kingdom, May 31, 1973, 26076/73
Int. Cl.² B21F *9/02*
U.S. Cl. 140—93.2 **9 Claims**



1. A strapping tool of the kind comprising jointing means for securing together the overlapping ends of a loop of strapping which has been tightened around a package and tensioning means including a rotary dog and a support opposite the rotary dog, in use at least one end of a loop of strapping being disposed between the rotary dog and the support, the rotary dog being urged into frictional engagement with the face of said one end of the loop of strapping and rotated to tension the loop wherein the strapping tool further comprises sensing means responsive to bodily movement of the rotary dog having at least a component in a direction normal to the strapping and towards the support, for initiating or permitting the making of the joint by the jointing means when such movement exceeds a pre-determined amount.

3,929,173
MATERIALS DISPENSING APPARATUS
Curtis Mauroner, 627 W. Concord, Orlando, Fla. 32801
Filed Mar. 22, 1974, Ser. No. 453,684
Int. Cl.² B65B *3/06*
U.S. Cl. 141—74 **8 Claims**

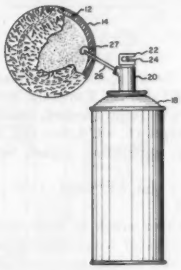


1. The combination comprising an elongated trackway having spaced apart parallel rails, a plurality of open top horizontally arranged forms that are located in the space between said rails and spaced apart along the trackway for use in casting vertical wall sections from cementitious materials, and an apparatus for storing and dispensing said materials into said forms, said apparatus comprising a rigid body frame having a bottom portion and a top portion which is vertically spaced from said bottom portion, wheels rotatably mounted on said rails and supporting said body frame over the space therebetween, a rigid frame mounted on said body frame and vertically movable between the top and bottom portions thereof, a carriage supported on the vertically movable frame, said carriage being horizontally movable on said vertically movable frame and in parallel with said rails, a plurality of elongated bins arranged transversely of the trackway and mounted on and movable with said carriage, each of said bins having an open top portion for receiving cementitious material to be stored therein, an elongated transversely arranged narrow bottom opening for discharging the stored cementitious material into said forms, and a gate movable between open and closed positions with respect to the bottom opening of the bin, said apparatus further comprising manually controllable powered means secured to the body frame for vertically moving the vertically movable frame, manually controllable powered means secured to the vertically movable frame for horizontally moving said carriage on said vertically movable frame, and manually controllable powered means supported by and movable with the carriage for moving the gate between the open and closed positions therefor.

3,929,174
MEANS FOR REJUVENATING TENNIS BALLS AND THE LIKE
Luis L. Isnardi, Jr., 19400 Sorenson Ave., No. 141, Cupertino, Calif. 95014
Filed Nov. 9, 1973, Ser. No. 414,460
Int. Cl.² B65B *3/10*
U.S. Cl. 141—329 **3 Claims**

1. Apparatus for pressurizing and maintaining the air pressure within the interior of a tennis ball comprising:
a. a sealed container;
b. a sealant contained within said container;
c. a liquid contained within said container which when exposed to reduced pressures is converted into a pressurized gaseous state;
d. means for creating an aerosol composed of said gas and said sealant, said means including a valve assembly forming a part of said container for lowering the pressure within said container to cause said liquid to convert into the pressurized gaseous state;
e. a conduit forming a part of said container for providing an outlet for said aerosol, said conduit having a sharpened

tip to enable penetration thereof within the interior of a tennis ball to enable the aerosol to enter within the tennis



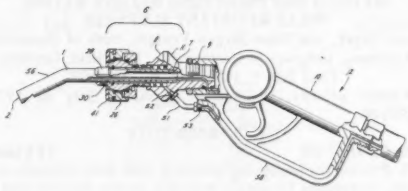
ball to increase the pressure therein, and whereby said sealant acts to seal both the hole caused by said tip when removed as well as other holes in the tennis ball walls.

3,929,175 16-DCW

VAPOR RECOVERY FUEL NOZZLE APPARATUS

Malcolm G. Coone, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed June 28, 1974, Ser. No. 484,133
Int. Cl.² B67D *5/37*; **F16L** *27/06*
U.S. Cl. 141—392 **18 Claims**



1. In a nozzle apparatus for use in transmitting fluid hydrocarbons from a holding tank to a receiving tank having a tubular receiving member, and for recovery of fumes resulting from said transmission, the improvement which comprises:

A. An elongated tubular member for discharge therethrough of fluid hydrocarbons;

B. Means on the elongated tubular member for positioning the apparatus within the tubular receiving member of the receiving tank;

C. Ball means on the elongated tubular member for rotational movement relative to the elongated tubular member;

D. Means affixed to the ball means for sealing engagement of the apparatus to the tubular receiving member; and

E. Means for transmission of fumes within the tubular receiving member through the nozzle apparatus.

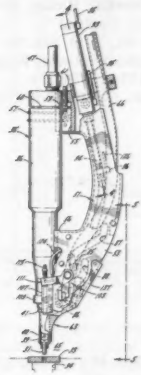
3,929,176

MACHINE FOR AUTOMATICALLY DRIVING THREADED FASTENERS

Paul H. Dixon, Belvidere, Ill., assignor to Babette Dixon, Trustee, Belvidere, Ill.

Filed Oct. 25, 1974, Ser. No. 517,920
Int. Cl.² B25B *23/10*
U.S. Cl. 144—32 **22 Claims**

1. A machine for automatically driving a threaded fastener into a workpiece and comprising a power-rotated fastener driver, a finder telescoped over said driver and having an end portion sized to telescope over a fastener, means for supporting said finder for movement between extended and retracted positions along said driver, means for urging said finder to and for normally keeping said finder in said extended position, mechanism for delivering a fastener to a driving position in which the fastener is in line with said end portion of said finder, and means associated with said mechanism for causing



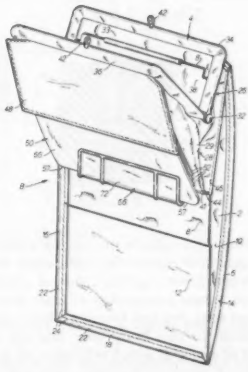
said finder to move from its extended position and toward its retracted position as said fastener is moved toward said driving position and then for causing said finder to move back to its extended position and into telescoping relation with said fastener after the fastener has been delivered to said driving position.

3,929,177

PASS CASE

John P. Reis, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.

Filed Apr. 28, 1975, Ser. No. 572,530
Int. Cl.² A45C *1/08*, *11/18*
U.S. Cl. 150—35 **14 Claims**



1. In combination a flexible wall including two opposed ends, a coin purse attached to said flexible wall adjacent one of said ends, said coin purse having an openable end and a closed end, a pass case secured to said coin purse, said pass case including at least one folded flexible plastic wing releasably connected in hinged relation to the open end of said coin purse, a flexible flap secured to said coin purse adjacent said openable end and covering said flexible plastic wing, and a restraining means secured to said flexible wall adjacent to the closed end of said coin purse releasably restraining said flexi-

ble flap against said flexible wings and securing said pass case against said coin purse.

3,929,178

FLEXIBLE CONTAINERS

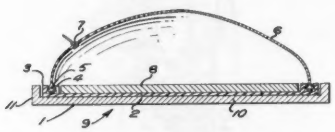
Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England

Filed May 21, 1974, Ser. No. 472,037

Claims priority, application United Kingdom, May 24, 1973, 24802/73; Mar. 28, 1974, 13786/74

Int. Cl.² B65D *51/16*

U.S. Cl. 150—52 K **14 Claims**



1. A flexible container comprising a flexible, impermeable base member which includes an upstanding part having a continuous channel encircling an area of the base member, a load-bearing rigid member fitting within said upstanding part, a flexible impermeable cover with sealing means adapted to co-operate with the channel to provide a fluidtight seal therewith sealing the perimeter of the cover to the base member and valve means controlling an outlet for air from the interior of the container whereby suction can be applied to and maintained within the said interior.

3,929,179

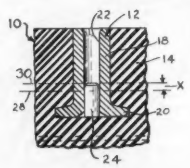
INDICATOR DEVICE FOR INDICATING TREAD WEAR AND TIRE INCORPORATING THE INDICATOR

Edwin W. Hines, Slippery Rock, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Dec. 5, 1973, Ser. No. 421,941

Int. Cl.² B60C *19/10*

U.S. Cl. 152—330 A **12 Claims**



8. In combination a vehicle tire having a tread portion, and tread wear indicator means for indicating when the tread portion has worn down a predetermined amount, said tread wear indicator means comprising at least one rod-like body having a flange near one end forming a head, and a hard wear resistant element in said body near said on end, said body being formed of material which will wear off at a rate not less than the rate of wear of the tread and said wear resistant element having a wear rate substantially less than the wear rate of treads, said rod-like body imbedded in a blind hole of said tread portion at at least one circumferential region thereof with the head near the bottom of the hole and the other end of the body substantially flush with the tread surface and said wear resistant element having a radially outwardly facing axial region which is disposed near that level in the tread portion that it is desired to indicate a worn condition of the tread portion, said region of said rod-like body when exposed by the tread portion wearing down to the said level providing a discernable indication, the indication provided by said wear resistant element comprising an indication which is audible when the tire rolls on a roadway.

3,929,180

TYRES

Shoji Kawase, Iwakuni; Kenji Maeda, Kobe; Shiro Kumakawa, and Takatoshi Kuratsuji, both of Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 16, 1974, Ser. No. 506,506

Claims priority, application Japan, Sept. 20, 1973, 48-105409

Int. Cl.² B60C *1/00*

U.S. Cl. 152—359 **5 Claims**

1. A reinforced tyre which is characterized in that its carcass material consists of a cord composed substantially of polyethylene 2,6-naphthalate, said cord, as set in a tyre, having a twisting coefficient, K-value, of 1600 to 3300, a modulus under 2% extension of 40 – 160 g/denier, and a dry heat shrinkage of no greater than 3% when exposed to the temperature of 150°C. for 30 minutes, with the definition of K as below $K = T\sqrt{D}$

in which

T denotes the number of folded twist per 10 cm of the cord, and

D denotes the total denier of the filaments constituting the cord.

3,929,181

METHOD FOR PRODUCING ALLOYS HAVING WEAR-RESISTANT SURFACES

Horst Beyer, and Hans-Jürgen Veutgen, both of Burscheid, Germany, assignors to Goetzewerke, Burscheid, Germany

Filed July 5, 1973, Ser. No. 376,297

Claims priority, application Germany, July 6, 1972, 2233148

Int. Cl.² B22D *27/18*

U.S. Cl. 164—58 **14 Claims**

1. Process for producing materials with wear-resistant surfaces, comprising forming a melt of a matrix material and at least one substance which forms at least one hard solid phase having a density other than that of the matrix material and which separates from the basic matrix material during hardening, casting the resulting melt and subjecting the molten casting to mass acceleration during the hardening process.

3,929,182

METHOD OF CENTRIFUGALLY CASTING HOLLOW SPHERES

Juan Jose Amado, Jr., Aptdo. 4241, Panama 5, R.P., Panama

Division of Ser. No. 412,614, Nov. 5, 1973, Pat. No. 3,856,452. This application Sept. 16, 1974, Ser. No. 506,443

Int. Cl.² B22D *13/00*

U.S. Cl. 164—114 **4 Claims**

1. A method of centrigually casting hollow spheres from molten metal comprising the steps of

a. disposing a rotatable platform means for rotation by a first drive shaft about a first axis,

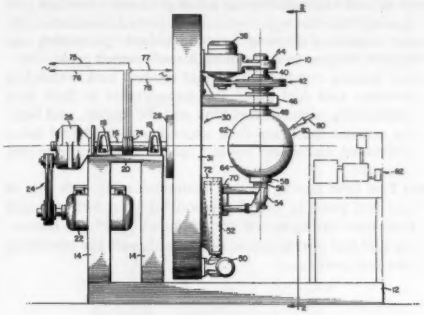
b. mounting a second drive shaft parallel to the plane of said rotatable platform for rotation about a second axis which is perpendicular to said first axis and in a common plane therewith,

c. providing a pair of mold parts to form a separable mold for the reception of molten metal,

d. partially filling said separable mold with a molten metal,

e. clamping said mold with a pair of clamping members at least one of which may be advanced toward and away from said mold parts so as to clamp said mold with its center of rotation at the intersection of said first and second axes,

f. and rotating said mold about said two axes of rotation and gradually solidifying said molten metal under the influ-



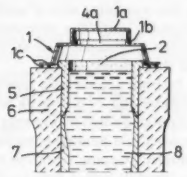
ence of the centrifugal rotational forces established to form a hollow sphere.

3,929,183

METHOD FOR SEALED SYSTEM OF HOT TOPS, INGOT MOULDS OR A COMBINATION OF INGOT MOULD AND HOT TOP AND AN ARRANGEMENT FOR SAID SEALED SYSTEM

Hannes Vallak, Geneva, Switzerland, assignor to Enn Vallak, Geneva, Switzerland

Filed June 25, 1974, Ser. No. 482,882
Claims priority, application Sweden, July 6, 1973, 7309558
Int. Cl.² B22D *7/10, 27/06*
U.S. Cl. 164—123 **15 Claims**



1. An improved method of casting metals in an ingot mould comprising the steps of enclosing a heat radiation retarding material in a sealed enclosure, teeming molten metal into said mould through an open end of said mould, positioning said sealed enclosure and material within said mould, closing said open end of said mould, releasing said material from said enclosure onto the molten metal while said mould is closed thereby ensuring that the heat radiation retarding material is not dispensed in the air surrounding the exterior of the mould.

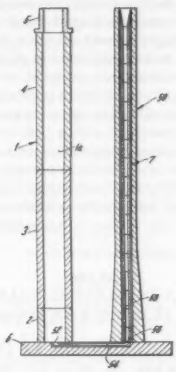
3,929,184

APPARATUS FOR PRODUCING BLANK METAL INGOTS OF UNIFORM CROSS SECTION AND IN PARTICULAR STEEL INGOTS

Guido Reuter, Dusseldorf, and Hans Robertz, Monchengladbach, both of Germany, assignors to Rheinstahl Aktiengesellschaft, Germany

Division of Ser. No. 179,007, Sept. 9, 1971, abandoned. This application Oct. 15, 1973, Ser. No. 406,191
Int. Cl.² B22D *41/08*
U.S. Cl. 164—309 **10 Claims**

1. A casting apparatus comprising a flat mold casting plate having a pouring passage defined therethrough, and a vertically elongated mold located over said casting plate overlying said pouring passage and being made up of a plurality of tubular sections vertically interfitting and being of a length of at least 2 meters and a diameter over 250 mm, and filling passage means connected into said pouring passage on said



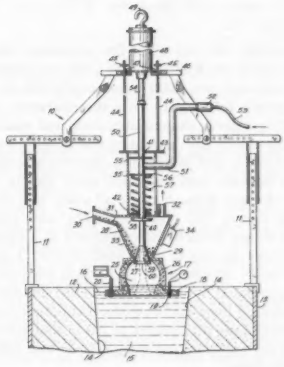
casting plate for filling said mold through said pouring passage and upwardly into the interior of said mold.

3,929,185

APPARATUS FOR TREATING CAST MATERIALS IN THE MOLTEN STATE

Liviu B. Wiener, 105-40 62nd Road, Forest Hills, N.Y. 11375

Division of Ser. No. 381,510, July 23, 1973, Pat. No. 3,882,922. This application Jan. 8, 1975, Ser. No. 539,274
Int. Cl.² B22D *7/10, 27/00*
U.S. Cl. 164—338 **4 Claims**



1. An apparatus for treating a molten metal cast body comprising:

a. reservoir means for storing a prescribed amount of reactant to be introduced below the surface of said molten metal, said reservoir means being provided with a bottom opening and inlet and outlet ducts for introducing said reactant;

b. a refractory plunger adapted to be affixed beneath said reservoir means, said plunger including a reaction chamber having an upper opening adapted to cooperate with said reservoir means bottom opening and adapted to be immersed in molten metal;

c. an injection plunger slidably mounted for vertical movement within said reservoir means and said reaction cham-

ber, said injection plunger being hollow and having upper, middle and lower portions, said upper portion being provided with means adapted to introduce gas under pressure to said molten metal, said middle portion being provided with a circular shaped flange adapted to seal said upper opening when said injection plunger is lowered into said molten metal, said lower portion being provided with a frusto conical head adapted to seal said upper opening when said head is in its uppermost position and adapted to release said reactant when lowered therefrom, said head being provided with a porous opening therein adapted to be inserted beneath the surface of said molten metal and bubble said gas therethrough; and

d. means for mounting and lowering said refractory plunger to the surface of said molten metal and said injection plunger beneath the surface of said molten metal.

3,929,186

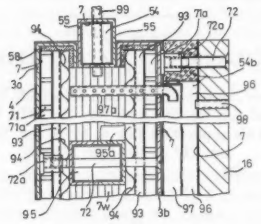
THERMALLY INSULATING WALL UNITS

Otto Alfred Becker, 59 Robert Koch Strasse, D-6600 Saarbrucken, Germany

Continuation of Ser. No. 37,068, May 13, 1970, abandoned. This application Feb. 20, 1974, Ser. No. 444,003

Int. Cl.[2] F24H *9/08*

U.S. Cl. 165—49 **12 Claims**



1. An assembly of wall units for providing thermal and acoustic insulation, each of said wall units comprising at least one outer panel and one inner panel connected to the outer panel, said panels forming a cavity therebetween, the cavity being air-tightly closed, shaped insulating and spacing means disposed in the cavity, said insulating and spacing means being formed of relatively stiff material so as to transversely rigidify the wall unit between said outer and inner panels, means for circulating a dry gas through said wall units, said means comprising a gas supply line communicating with each of said cavities, said supply lines being connected to a common supply line for supplying gas to all of said cavities, a gas take-off line in each cavity spaced from said supply line, said take-off lines being connected to a common take-off line for removing gas simultaneously from said cavities, a volume compensating device for controlling the volume of gas in said wall units, and pump means for recirculating the gas from said take-off lines to said supply lines.

3,929,187

VIBRATION RESISTANT HEAT EXCHANGER FOR INTERNAL COMBUSTION ENGINES

Edwin E. Hurner, 2605 S. Rivershore Drive, Moorhead, Minn. 56560

Filed Dec. 23, 1974, Ser. No. 536,034

Int. Cl.[2] F02M *31/02*

U.S. Cl. 165—52 **6 Claims**

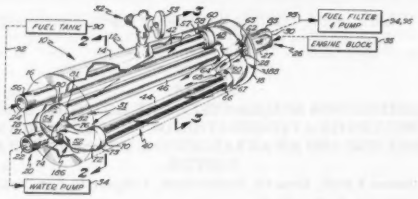
1. A vibration resistant heat exchanger for internal combustion engines to preheat fuel flowing between a fuel tank and the engine and usable with a supply of flowing, heated coolant comprising:

a fluid-tight coolant tank including an elongated cylindrical sidewall and first and second endwalls, an endwall being positioned at each end of said cylindrical sidewall and fixed to said sidewall in sealed relationship therewith;

each of said endwalls having a fuel port and a coolant port passing therethrough, said coolant ports connectable with the supply of flowing heated coolant, permitting the heated coolant to flow through said coolant tank;

a fuel heating conduit within said coolant tank, extending between said fuel ports and connectable in fluid flow relationship with the fuel tank and the engine, said heating conduit including first, second and third fuel tubes positioned within said coolant tank and spaced from said sidewall;

said first tube having an end communicating with one of said fuel ports in sealed relationship therewith and said third tube having an end communicating with the remaining said fuel port in sealed relationship with the remaining said fuel port;



said heating conduit further including a pair of generally U-shaped couplers, a coupler being positioned adjacent each endwall, one of said couplers connecting the remaining end of said first tube in fluid flow relationship with an end of said second tube, and the remaining coupler connecting the remaining end of said second tube in fluid flow relationship with the remaining end of said third tube to permit continuous flow of fuel through said first, second and third tubes; and

each said coupler bearing against said sidewall and against said adjacent endwall and cooperating with one another to wedge said heating conduit within said coolant tank to prevent movement of said heating conduit relative to said coolant tank, thereby stopping vibration and loosening of said fuel heating conduit within said coolant tank.

3,929,188

HEAT EXCHANGER INSTALLATION FOR A CLOSED GAS CIRCULATORY SYSTEM, SUCH AS A THERMAL POWER PLANT, FOR EXAMPLE

Dieter Brinkmann, Erlangen; Wolfgang Simon, Kersbach, and Heinrich Zimon, Hemhofen, all of Germany, assignors to Kraftwerke Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed June 3, 1974, Ser. No. 475,837

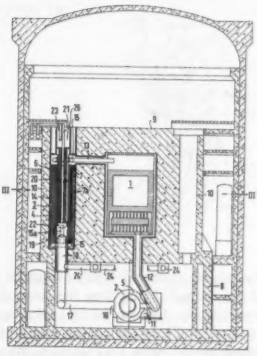
Claims priority, application Germany, June 5, 1973, 2328556

Int. Cl. A23c *3/02*

U.S. Cl. 165—66 **5 Claims**

1. Heat exchanger installation for assembly in a closed gas circulatory system which includes a heat consumer and a heat source located upstream of said heat consumer in flow direction of gas in said circulatory system, comprising a recuperative heat exchanger, a precooling heat exchanger, and means for conducting gas, that has been cooled in the heat consumer, through said recuperative heat exchanger for preheating the gas to said precooling heat exchanger for removing heat from the circulatory system, said precooling heat exchanger for removing heat from the circulatory system being connected to the heat source through a compressor and through said recuperative heat exchanger for preheating the gas, one of said heat exchangers having tubes disposed around a centrally located space, and the other of said heat exchangers having

tubes projecting into said centrally located space, supply and discharge lines for heat exchanging working medium traversing the tubes of said heat exchangers being located at one end of each of said heat exchangers, a supply inlet for heated waste gas delivered from the heat source and a gas discharge outlet both being located at the other ends, respectively, of said



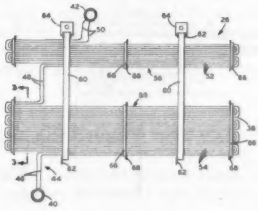
recuperative heat exchanger for preheating the gas and of said precooling heat exchanger for removing heat from the circulatory system, and flowthrough opening means for the gas located between said centrally located space and the space surrounding the same at said other ends of said heat exchangers at which said waste gas supply inlet and said gas discharge outlet are located.

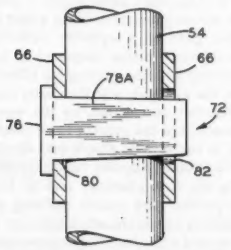
3,929,189

HEAT EXCHANGER STRUCTURE

Andrew P. Lecon, Akron, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 20, 1974, Ser. No. 452,859
Int. Cl.² F28F 7/00
U.S. Cl. 165—69 **6 Claims**





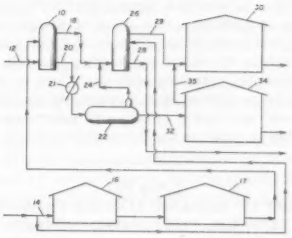
1. A tubular heat exchanger disposed within a passageway, means for conveying a heated fluid stream over the heat exchanger and means for passing a fluid to be heated through the heat exchanger, said heat exchanger having at least one bank of spaced tube rows arranged across the fluid stream in side-by-side parallel relation, each of the rows being formed of substantially coplanar return bend tube segments spaced in the direction of flow of the fluid stream, and means for suppressing vibration of the heat exchanger, said last named means including rigidly connected first and second intersecting plate members, wherein first plate members are paired to contiguously straddle each of at least some of said rows, and second plate members are spaced from and extend between return bend tube segments of said straddled rows, the first plate members being slotted to accommodate the substantially perpendicular extension therethrough of intersecting second plate members, and said second plate members being press fit into respective slots of at least one of the first plate members intersecting therewith.

3,929,190

SECONDARY OIL RECOVERY BY WATERFLOODING WITH EXTRACTED PETROLEUM ACIDS

Harry L. Chang; Evin L. Cook, and Ralph F. Burdyn, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,009
Int. Cl.² E21B 43/22
U.S. Cl. 166—274 **10 Claims**



1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the method comprising:

a. contacting a petroleum oil with an aqueous alkaline solution to extract neutralized organic acids from said oil in said aqueous medium,

b. separating the resulting aqueous solution of neutralized organic acids from said oil,

c. injecting said aqueous solution of neutralized organic acids into said reservoir via said injection system,

d. thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and

e. recovering oil from said production system.

3,929,191

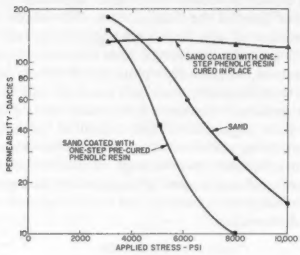
METHOD FOR TREATING SUBTERRANEAN FORMATIONS

John Wayne Graham; Thomas Wayne Muecke, and Claude Everett Cooke, Jr., all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 497,797, Aug. 15, 1974, abandoned. This application Sept. 25, 1974, Ser. No. 509,155
Int. Cl.² E21B 43/02, 43/26
U.S. Cl. 166—276 **36 Claims**

1. A method of treating a subterranean formation which comprises placing in or adjacent said formation particulate

material coated with a fusible, one-step, resole-type phenolic resin and thereafter causing said resin to fuse and cure to an


PERMEABILITY - DARCIES
APPLIED STRESS - PSI
SAND COATED WITH ONE-STEP PHENOLIC RESIN CURED IN PLACE
SAND
SAND COATED WITH ONE-STEP PRE-CURED PHENOLIC RESIN

infusible state to thereby bond the particulate material together.

3,929,192

PROCESS FOR TREATMENT OF WELLS WITH NITROGEN TETROXIDE

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Los Angeles, Calif.

Filed Mar. 11, 1974, Ser. No. 449,770
Int. Cl.² E21B *43/27*
U.S. Cl. 166—300 **6 Claims**

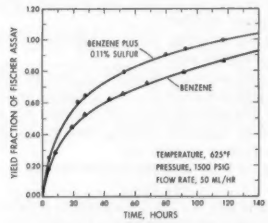
1. A process for chemical treatment of wells comprising:
providing an acidizing composition of nitrogen tetroxide;
injecting said composition through the well bore into the subterranean formation surrounding the well;
said composition reacting with the water in situ in said formation to form at least a substantial amount of nitric acid, said acid being effective to react with formation materials to increase the permeability of said formation.

3,929,193

RECOVERY OF ORGANIC MATTER FROM ORGANIC MINERAL-CONTAINING DEPOSITS

Roy B. Duke, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 380,783, Aug. 9, 1973. This application Sept. 23, 1974, Ser. No. 508,585
Int. Cl.² E21B *43/24*
U.S. Cl. 166—303 **9 Claims**



Extraction of oil shale with benzene and sulfur.

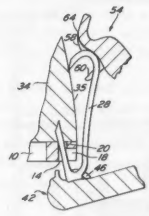
1. A process for the recovery of organic matter from organic mineral-containing deposits selected from the groups consisting of tar sands, oil shale, lignite, torbanite, coorongite and kukersite, by contacting the organic mineral-containing deposits at a temperature of from about 200 to about 1000°F with an extraction fluid and elemental sulfur, said elemental sulfur being present in the range of from about 0.001 to about 0.5 parts by weight of sulfur per part by weight of extraction fluid.

3,929,194

HORSESHOEING METHOD AND NAIL

Mark Warfel, R.D. 2, Halifax, Pa. 17032

Filed Aug. 8, 1973, Ser. No. 387,825
Int. Cl.² A01L *7/10*
U.S. Cl. 168—23 **4 Claims**



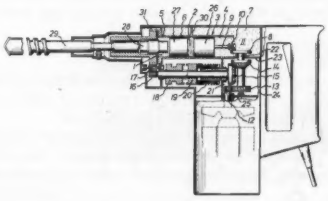
1. A method of applying shoes to hoofed animals without entering the life of the animal comprising the step of placing a shoe so that it overlies the bottom surface of a hoof, and coupling the shoe to the hoof by nails having first and second prongs without hammering the nails, said coupling step including introducing one prong of a nail through a hole in the shoe while the other prong on the nail is pointed toward a side face of the hoof, and then simultaneously applying pressure to both prongs to enter into the hoof and secure the shoe to the hoof.

3,929,195

HAMMER DRILL

Erwin Stiltz, Winnenden; Boris Langhoff, Backnang, and Manfred Spieth, Bietigheim, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Aug. 26, 1974, Ser. No. 500,733
Claims priority, application Germany, Aug. 25, 1973, 2343014
Int. Cl.² B23B *45/00*; B25D *11/00*
U.S. Cl. 173—109 **8 Claims**



1. In a hammer drill having a drive motor; a gearing driven by the drive motor; housing means defining a first chamber for accommodating the gearing; a cylinder defining an inner cylinder chamber; a work piston disposed in the cylinder chamber and connected with the gearing for effecting a reciprocation thereof in the cylinder; a striker body freely slidable in the cylinder chamber and driven by the work piston; a spindle sleeve connected to the gearing to be rotated thereby; a tool bit inserted in the spindle sleeve and operatively connected with the striker body; housing means defining a second chamber adjoining the first chamber and at least partially surrounding the cylinder; and means defining ports in the cylinder for maintaining communication between the cylinder chamber and the second chamber; the improvement comprising means for maintaining a permanent, lubricant-tight isolation of said second chamber and said cylinder chamber from said first chamber.

3,929,196
ICE AUGER

Uuno Rantanen, Rauhankatu 2-4 A 5, Heinola, Finland

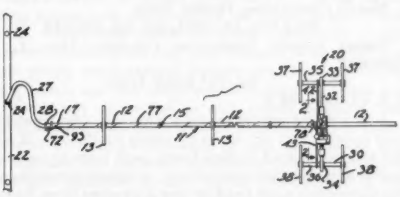
Filed Aug. 16, 1974, Ser. No. 498,042
Claims priority, application Finland, Apr. 26, 1974, 1293/74
Int. Cl.² E25C 5/04
U.S. Cl. 175—18 3 Claims

1. Improvement in an ice auger, comprising an axially extending body tube, an ice removal helix wound around said body tube, said body tube having a first end and a second end, a blade attached to the first end of said body tube and a hand crank attached to the second end of said body tube, said body tube comprising a lower section extending axially from said first end to a point intermediate said first and second ends and an upper section extending from the intermediate point toward said second end, a hinge located at the intermediate point and pivotally connecting said lower section and upper section together, said hinge comprising a first hinge half fixed to said lower section and a second hinge half fixed to said upper section, each of said first and second hinge halves comprising two plates spaced apart and extending in parallel relation with the axis of said body tube, each of said plates having an outer end spaced laterally outwardly from said body tube and an inner end located on the opposite side of the axis of said body tube from said outer end, a hinge pin connecting the outer ends of said plates of said first and second hinge halves together, and a locking pin releasably connecting the inner ends of said plates of said first and second hinge halves, wherein the improvement comprises that said ice helix comprises a first helix section secured to said lower section of said body tube and a second helix section secured to said upper section, said first helix section at the intermediate point attached to said first hinge half and said second helix section at the intermediate point attached to said second hinge half.

3,929,197
LATERAL ROLL IRRIGATION MACHINE HAVING REMOTE END CONTROL

Corwin Malott, and Robert William Erath, both of Spokane, Wash., assignors to Alumax Mill Products, Inc., Spokane, Wash.

Filed Jan. 6, 1975, Ser. No. 538,914
Int. Cl.² B60K 23/00
U.S. Cl. 180—2 16 Claims



1. A lateral move irrigation pipeline system, comprising:
an elongated irrigation pipeline;
a plurality of longitudinally spaced wheels coaxially mounted on the pipeline to support the pipeline above the ground level and to enable the pipeline to be moved laterally across a field;
a wheeled power unit mounted to the pipeline intermediate the ends of the pipeline for moving the wheel-supported pipeline in either lateral direction;
said power unit having an internal combustion engine with an engine starting means, an engine stopping means and a drive means selectively operatively connected to the internal combustion engine and the pipeline;
remote operation control means operatively connected to the engine starting means, the engine stopping means and the drive means for selectively rendering effective the engine starting means, the engine stopping means and the drive means remotely from the power unit;
said remote operational control means having a remote control console having operator controlled switching means for selectively generating separate command digital signals (1) to energize the engine starting means to start the engine, (2) to stop the engine, and (3) to energize the drive means to drive the wheeled pipeline laterally;
said remote control console having a multiplexer for converting the command digital signals and formulating a multiplex signal according to a selected code;
a demultiplexer at the power unit for converting the multiplex signal and formulating separate instructional digital signals according to the selected code;
a signal transmission means operatively interconnecting the multiplexer and the demultiplexer to transmit the multiplex signal therebetween;
logic switching means at the power unit operatively interconnecting the demultiplexer with the engine starting means, the engine stopping means and the drive means to selectively activate same in response to the separate instructional digital signals.
a tachometer operatively connected to the engine for generating an analog signal responsive to the magnitude of the engine RPM: and
wherein said logic switching means further includes a logic interlock network means responsive to the analog signal generated by the tachometer for deactivating the engine starting means when the engine reaches a pre-selected RPM.

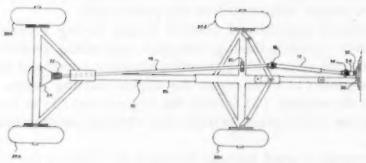
3,929,198
TRACTOR-TRAILER PULLING AND GUIDING DEVICE

Harrison Lee Dalton, Rte. No. 1, Franklin, Tenn. 37064

Filed Apr. 29, 1974, Ser. No. 465,321
Int. Cl.² B62D 59/02
U.S. Cl. 180—14 A 4 Claims

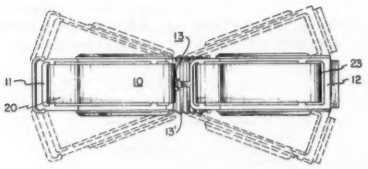
1. A four wheel front and rear axle trailer driving unit the front wheels of which are steerable by a towing draft connection to a pulling vehicle comprising a single jointed drive shaft linking together a ground take-off unit at the rear of said pulling vehicle with a rear differential positioned substantially half-way between the two wheels of the rear axle of said trailer which follows or runs behind said pulling vehicle, said single jointed drive shaft having a pillow block bearing providing support and a linkage of a first universal joint forward of said

front axle and a second universal joint forward of said rear axle enabling said trailer to be driven by, steered with and



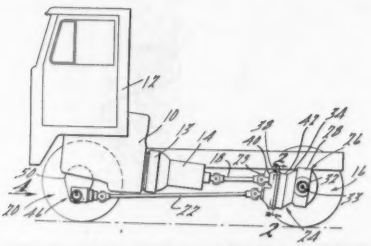
follow the contour of the pulling vehicle at substantially the same speed or gear at which the pulling vehicle is moving.

3,929,199
SNOW MACHINE
Ivan Van Warren, P.O. 117, Greenleaf, Idaho 83620
Filed Sept. 26, 1974, Ser. No. 499,351
Int. Cl.² B62D *11/04*
U.S. Cl. 180—14 R **6 Claims**



1. A steering joint for articulated vehicles having a control unit and a trailing unit comprising:
- a housing including a mounting flange having means for fastening said flange centrally in the rearwardmost terminal end of said control unit, and a horizontal support plate issuing rearwardly from said flange;
- a sprocket being fastened on a vertically disposed shaft which is journally mounted to said support plate, said sprocket being provided with a roller chain connected to a suitably controlled actuator in said control unit;
- a pivot plate being fastened perpendicularly to said shaft carrying said sprocket, said pivot plate being fastened to the forwardmost terminal end of said trailing unit; and
- said chain issues through a hole in said mounting flange and about said sprocket, said chain being held in parallel alignment through said hole by a pair of sprockets journally mounted to said support plate adjacent said hole.

3,929,200
DRIVE TRANSFER GEAR ASSEMBLY FOR FOUR-WHEEL DRIVE VEHICLE
Marcel N. Behar, Southfield, Mich., assignor to Eaton Corporation, Ohio
Filed Oct. 5, 1972, Ser. No. 295,340
Int. Cl.² B60K *17/00*
U.S. Cl. 180—49 **8 Claims**

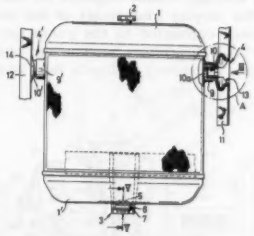


1. A torque proportioning drive transfer gear assembly for a motor vehicle of the type including a first drive axle, a second drive axle, and an engine; said assembly comprising:
- A. an input shaft adapted to be coupled to the output of said engine;
- B. torque proportioning gear means coaxial with the rotational axis of said input shaft and having an input gear driven by said input shaft and first and second relatively rotatable output gears driven by said input gear and adapted to be drivingly connected to said first and second axles, respectively;
- C. a first annular member fixed to rotate with one of said gears but slideable axially relative to said one gear;
- D. clutch means on said first annular member;
- E. a second annular member mounted on the exterior periphery of said first annular member for rotation therewith but axially slideable relative thereto;
- F. clutch means on said second annular member;
- G. first clutch means on another of said gears operative in response to axial movement of one of said annular members to coact with the clutch means on said one annular member to preclude relative rotation between said one gear and said other gear in one directional mode while allowing relative rotation in the other directional mode; and
- H. second clutch means on said other gear adapted in response to axial movement of the other annular member to coact with the clutch means on the other annular member to preclude relative rotation between said one gear and said other gear in either directional mode.

3,929,201
RADIATOR MOUNTINGS FOR INTERNAL COMBUSTION ENGINES
Willi Hoffman, Bauschheim, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 10, 1975, Ser. No. 548,685
Claims priority, application Germany, Mar. 1, 1974, 2409822
Int. Cl.² B60K *11/04*
U.S. Cl. 180—68 R **5 Claims**

1. In a motor vehicle having a body with a horizontal frame part forming part of a lower mounting for the base of a radiator and two spaced vertical frame parts forming parts of two lateral mountings for said radiator, a radiator mounting assembly comprising a pin fixed on and depending from the base of said radiator centrally thereof; an elastomeric block fixed on said horizontal frame part, said block having therein an upwardly opening cavity in which said pin is engaged to locate said radiator base on said horizontal frame part; a pair of

elastomeric elements respectively retained on opposite side portions of the radiator, each said element having therein a laterally opening cavity and said vertical frame parts each having an opening therein in substantial alignment with the cavity of the elastomeric element on the adjacent side of the radiator; and a pair of plugs respectively inserted in said vertical frame part openings from the outboard sides thereof, each said plug having a spigot portion which engages in the cavity of the elastomeric element adjacent thereto and a flange portion integral with said spigot portion, said vertical frame parts and said flange portions having interengaging formations by which said plugs are clamped to said vertical frame parts.

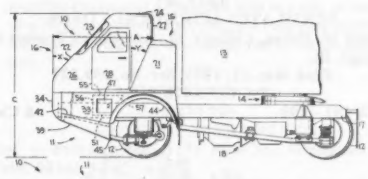


3,929,202

VEHICLE CAB CONFIGURATION EFFECTING REDUCTION OF AIR DRAG AND ENHANCING STORAGE SPACE CAPACITY AND CONVENIENCE

Dean W. Hobbensiefken, Rte. 1, Box 39, Lyons, Oreg. 97358

Filed Apr. 21, 1975, Ser. No. 569,754
Int. Cl.² B60K *11/04*; B62D *35/00*
U.S. Cl. 180—68 R **11 Claims**



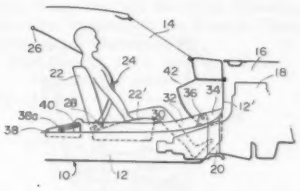
1. In a tractor-trailer combination vehicle having a gap between the tractor and the trailer, and an engine assembly mounted on said tractor between the front and rear axles thereof, a cab mounted on said tractor and having a flat horizontal roof at an elevation below the elevation of the trailer roof, and said cab having flat vertical side walls spaced apart a distance less than the distance between the side walls of the trailer, said cab further having a flat front wall interconnecting said cab roof and said cab side walls, said front wall sloping in a rearward direction of vehicle travel, said cab having panels extending transversely outwardly of the lower edges of said side walls, vertical side panels extending downwardly of said transversely extending panels, under panels interconnecting said side panels, and a vertical bumper panel interconnecting said side panels and said under panels, radiators on said cab being operatively connected to said engine assembly and extending laterally outwardly of said cab side walls, said radiators further extending rearwardly of said cab toward said trailer, whereby said radiators function in cooling the engine of the engine assembly as they are directly exposed to the oncoming air moving alongside said cab walls during movement of the vehicle in its forward direction of travel, and said radiators serve to partially close the gap between said cab and said trailer, thereby also functioning as an air shield at said gap, and whereby the configuration of said cab results in reduced horsepower needed to overcome aerodynamic drag during vehicle travel in the forward direction.

3,929,203

MOUNTING DEVICE FOR SHOULDER HARNESS TYPE SAFETY BELT

Yasuo Nagazumi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Jan. 17, 1974, Ser. No. 434,036
Claims priority, application Japan, Jan. 19, 1973, 48-8391
Int. Cl.² B60R *21/10*
U.S. Cl. 180—82 C **8 Claims**



1. A mounting device for use with a vehicle having a front engine and a vehicle body accommodating a seat and a shoulder harness, comprising

an elongate link disposed longitudinally of the vehicle on one side of the seat,

anchor means detachably connecting one end of the shoulder harness to said link,

a front support for the front end of said link movable rearward with said link upon displacement of the engine due to the collision of the vehicle, and

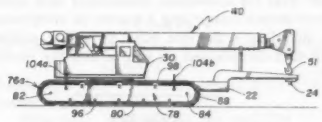
a rear support for the rear end of said link secured to a stationary part of the vehicle body and having means permitting longitudinal rearward movement of said link relative to the vehicle body resulting from said displacement of the engine.

3,929,204

TRAILER CRANE WITH OUTRIGGER TO CRAWLER CONVERSION

Lawrence Hugh Newell, 7316 143rd St. West, Apple Valley, Minn. 55124

Filed Jan. 22, 1975, Ser. No. 543,175
Int. Cl.² B62D *55/04*
U.S. Cl. 180—9.2 C **12 Claims**



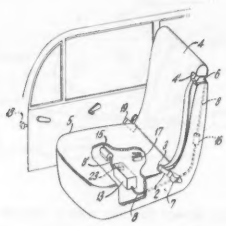
1. A trailer crane comprising an elongated chassis having forward and rear ends, coupling means at the forward end of the chassis for connecting said forward end to a tractor, wheel means near the rear end of the chassis for supporting said rear end so that said chassis can be pulled by a tractor, a crane carried on said chassis, first and second longitudinally spaced means at one side of said chassis for mounting a first pair of stabilizers, third and fourth longitudinally spaced means at the other side of said chassis for mounting a second pair of stabilizers, first and second crawlers each including a frame and an endless track, means for detachably mounting said first crawler to said first and second longitudinally spaced means, and means for detachably mounting said second crawler to said third and fourth longitudinally spaced means, whereby

said crawlers can be employed in lieu of stabilizers to independently maneuver said trailer when said forward end is uncoupled from said tractor.

3,929,205
THREE POINT SAFETY BELT SYSTEM WITH INERTIA ACTUATED INFLATABLE BELTS

Takezo Takada, deceased, late of Hikone, Japan, and by Juichiro Takada, heir, Tokyo, Japan, assignors to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 432,124
Claims priority, application Japan, Jan. 12, 1973, 48-5928
Int. Cl.² B60R *21/08*
U.S. Cl. 180—82 C **5 Claims**



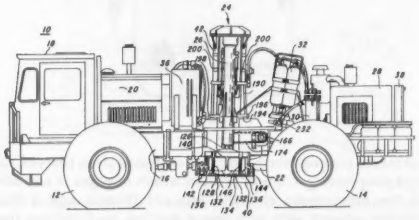
1. A safety belt system in a vehicle having a seat including a seat portion and a back rest comprising a first spring loaded retractor positioned proximate a first side of said seat portion, a second spring loaded retractor and a belt outlet positioned on said back rest at the same side as said first retractor with said belt outlet at the upper part of said back rest at least at the level of the shoulder of an occupant of said seat, an inflatable tubular lap belt extendable from and retractable by said first retractor, and of curved configuration in an inflated condition with its concave face confronting said back rest, a first coupling member conntected to the outer end section of said lap belt, a second coupling member positioned proximate the second side of said seat portion opposite said first side and releasably engageable with said first coupling member, a shoulder belt extendable from and retractable by said second retractor through said belt outlet and connected at its outer end section to said lap belt outer end section and applicator means for withdrawing and advancing said lap belt in a curved path from said retractor toward said seat portion second side to bring said first coupling member into registry with said second coupling member and for withdrawing and advancing said shoulder belt from said second retractor along a predetermined path extending forwardly from said outlet at above said shoulder level for a distance forward of said shoulder, said applicator means comprising a source of compressed air and means including a flexible tube providing communication between said compressed air source and the interior of said lap belt.

3,929,206
SERVO HYDRAULIC TRANSDUCER AND METHOD OF OPERATION

John W. Bedenbender, Plano, Tex., and Gilbert H. Kelly, Irving, Tex., assignors to Texas Instruments Co., Dallas, Texas

Filed Apr. 30, 1973, Ser. No. 355,838
Int. Cl.² G01V *1/04*
U.S. Cl. 181—114 **11 Claims**

1. A transportable hydraulic seismic transducer comprising:
a. a transport means for transporting hydraulic seismic transducer;
b. a vibrator means attached to the transport means, for producing mechanical vibrations;
c. a pad rigidly secured to the vibrator for generating acoustical energy in the earth responsively to the vibrations of the vibrator; and
d. a hydraulic system means operatively connected to the vibrator means for vibrating the vibrator to produce varying frequencies through a given frequency range for a sweep, including (i) a source of hydraulic fluid, (ii) pump means connected to the source of hydraulic fluid for pumping continuously throughout the sweep hydraulic fluid from the source at a volume rate less than the maximum average volume required for the vibrator to produce the varying frequencies of the sweep; (iii) a power source connected to the pump for driving the pump; (iv) a high pressure accumulator coupled to the pump means for storing hydraulic fluid under pressure

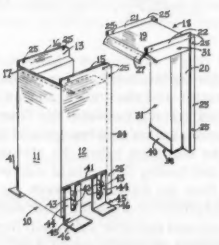


between sweeps and during the period of the sweep at which the pump volume exceeds the requirements of the vibrator means; (v) manifold means coupled to the pump means and high pressure accumulator for alternately introducing hydraulic fluid into and withdrawing hydraulic fluid from the vibrator means; and (vi) a control means connected to the manifold means for controlling the amount of hydraulic fluid introduced into the vibrator whereby the vibrator is activated to produce the varying frequencies of the sweep.

3,929,207
VENTILATED ACOUSTICAL COVER

Raymond W. Urban, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 559,327
Int. Cl.² A47B *81/06*
U.S. Cl. 181—198 **8 Claims**

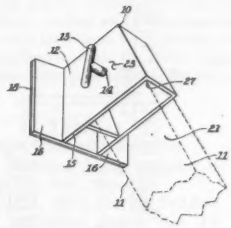


1. A ventilated acoustical cover for a noise-generating apparatus comprising
a. a metallic three-sided shell,
b. a removable section providing a top and end wall cooperating with said shell to form an open bottom cover,
c. means for removably connecting said section to said shell,
d. means within said cover for acoustically and thermally insulating the same,
e. means provided by said top wall of said section and one wall of said shell cooperating to provide an air chute having open communication with the interior of said cover,
f. and means for supporting said cover with its open bottom in a raised position whereby an air flow therethrough and out of said chute is maintained.

3,929,208
LADDER BEARING PLATE

Richard G. Hendrich, 1130 San Andres St. No. 23, Santa Barbara, Calif. 93101

Filed Dec. 19, 1973, Ser. No. 426,208
Int. Cl.² E06C *7/48*
U.S. Cl. 182—108 **1 Claim**



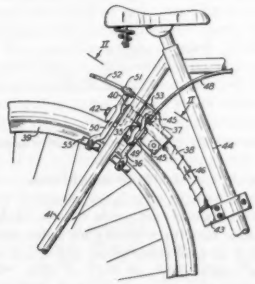
1. A bearing support device of a shape to fit over and completely about the top end section of a ladder rail, said device shaped in the form of a rectangular frame fitted with an external cushioned back surface on a back plate that serves as a bearing surface against a vertical surface upon which the rail of an equipped ladder rests in the erect condition, said cushioned back acting to protect the said vertical surface from disfigurement,

said frame formed with an internal recess of rectangular cross-section, open at both opposed ends, the cross-section of said recess of a size such that the frame fits completely about the top end section of a ladder rail, with the sides of said frame fastened to the back plate which is oriented at an angle to the axis of a ladder rail fitted in the recess of the frame, said back plate extending transversely from said frame, together with a male threaded member engaged in a threaded hole in a side of the frame, said threaded member serving as a clamping means to fix the frame to the side of a ladder rail in the installed position.

3,929,209
BICYCLE POWER BRAKE

Victor A. Peckham, Jr., 1151 Fifth St., Manhattan Beach, Calif. 90266

Division of Ser. No. 450,886, March 13, 1974, Pat. No. 3,882,971. This application Mar. 5, 1975, Ser. No. 555,414
Int. Cl.³ B62L *1/12*
U.S. Cl. 188—24 **9 Claims**

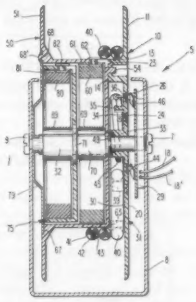


1. In a bicycle having a frame with a fork supported by a wheel rotatably mounted therein, a caliper brake mounted on said fork and straddling the peripheral portion of the wheel, a clamp straddling the peripheral portion of the wheel and normally disengaged from it, a bar extending part way around said wheel and rigidly attached to the frame, a carriage mounted on the bar for movement along it, means connecting said clamp to the carriage, manually operable means connected with the clamp for clamping it against the rotating wheel so that said carriage will be moved forward by the wheel, and a cam bar connected to said carriage and extending toward the brake, the brake having pivoted levers straddling the cam bar, and the cam bar being shaped to spread said levers farther apart to apply the brake to the wheel when the cam bar is moved forward by said carriage.

3,929,210
RETRACTABLE CORD REEL

Morris Cutler, Wyndmoor, and Bernard J. Tamarin, Philadelphia, both of Pa., assignors to The Vacuum Cleaner Corporation of America, Philadelphia, Pa.

Filed May 28, 1974, Ser. No. 473,885
Int. Cl.² H02G *11/00*
U.S. Cl. 191—12.2 R **12 Claims**



1. In a retractable electrical cord reel having an arbor comprising electrically conductive material, electrical conductor rings concentric therewith, and a nonconductive flange rotatable relative to the arbor and carrying the rings rotatively therearound, the improvement comprising a three-conductor electrical cord adapted to be wound onto and unwound from the reel, two of the conductors terminating in fixed contact with the respective conductor rings, and electrically conductive collar secured in fixed relation to the flange and encircling an electrically conductive portion of the arbor and in contact therewith, the third conductor of the cord terminating in fixed contact with the collar.

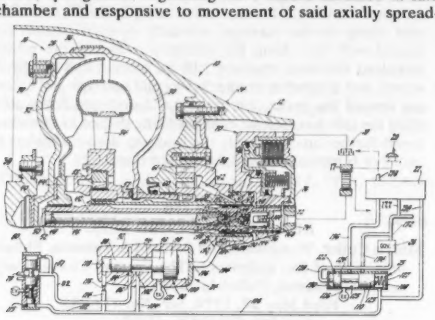
3,929,211
POWER TRAIN INCLUDING A TORQUE-PRESSURE TRANSDUCER

Don G. Maddock, Ypsilanti, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,279
Int. Cl.² F16D *25/00, 43/20*
U.S. Cl. 192—54 **5 Claims**

1. A torque-pressure transducer for use with a power train including a torque converter, a clutch, a shift valve, a source of fluid under pressure, a mainshaft, and a hollow turbine shaft operatively connected between said torque converter and said clutch for driving said mainshaft when said clutch is engaged, said torque-pressure transducer comprising a transducer shaft mounted in said hollow turbine shaft and fixedly secured to one end thereof, a chamber formed in the free end of said transducer shaft, an inlet into said chamber for said fluid under pressure, a plurality of longitudinally stacked members extending transversely across said chamber and operatively connected between said turbine shaft and said transducer shaft so as to be axially spreadable in said chamber in propor-

tion to the relative torque-responsive twist between said shafts, springbiased regulating valve means mounted in said chamber and responsive to movement of said axially spread-



able stacked members for regulating said fluid under pressure, and conduitry means communicating said regulated fluid from said regulating valve means to said shift valve.

3,929,212

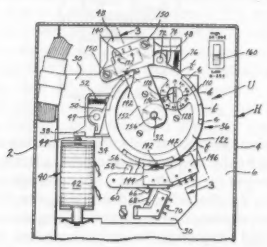
CONTROL MEANS FOR ADJUSTING THE VEND PRICE OF A COIN HANDLING MECHANISM

Norman J. Burzen, Pacific, Mo., assignor to Nordon Industries, Inc., Fenton, Mo.

Filed July 29, 1974, Ser. No. 492,778

Int. Cl.[2] G07F 9/00

U.S. Cl. 194—1 L **13 Claims**



10. In a coin handling unit, a cam rotatable about an axis for actuating switches as it rotates, said cam comprising first and second sections which are rotatable relative to each other and have lobes thereon which pass by and operate the switches as the cam revolves, the first section including front and back rings and the second section being an intermediate ring interposed between the front and back rings, a rotatable adjusting element rotatable about an axis fixed in position relative to the first section and engaged with the second section such that the second section rotates relative to the first section when the element rotates about its axis.

3,929,213

COIN-OPERATED TIMER UTILIZING MEASUREMENT OF ABSOLUTE CAPACITANCE FOR COIN TESTING

Richard Verrill, 23 Roper Close, Hillmorton, Rugby, Warwickshire, England

Filed Jan. 28, 1974, Ser. No. 437,519

Claims priority, application United Kingdom, Jan. 29, 1973, 4449/73

Int. Cl.[2] G07F 3/02

U.S. Cl. 194—100 A **5 Claims**

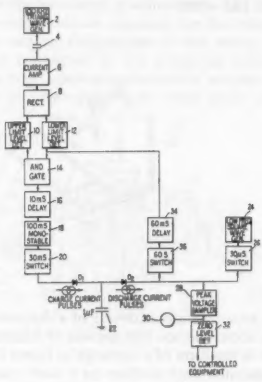
1. A coin operated timing device comprising:

a pair of parallel plates forming an electrical capacitance,

means for guiding a coin to pass between the said plates,

a first timer circuit, said first timer circuiting including a timing capacitor whose charge is increased each time a coin is inserted and which is periodically discharged a fixed amount,

capacitance monitoring means for measuring the absolute value of the capacitance of the parallel plates when the coin is passed between them, said capacitance monitoring means comprising:



a signal generator connected to one of said plates,

a rectifier connected to the other said plate,

a first, upper-level detector connected to the output of the rectifier; and a second, lower-level detector also connected to the said rectifier, and

means for initiating the operation of the timer circuit if the change in the absolute value of the capacitance when the coin passes between the plates falls within a range determined by the level detectors.

3,929,214

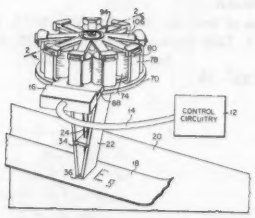
WIRE MATRIX BALLISTIC IMPACT PRINT HEAD

Donald G. Hebert, San Ramon, Calif., assignor to D & D Associates, Mountain View, Calif.

Filed Sept. 18, 1974, Ser. No. 507,060

Int. Cl.[2] B41J 3/50

U.S. Cl. 197—1 R **9 Claims**



1. A wire matrix ballistic impact print head comprising:

a base;

stylus guide means affixed to said base;

N electromagnetic structures mounted to said base and disposed around said guide means, each of said electromagnetic structures having an outer pole, a center pole coupled to said outer pole, and a coil disposed around one of said poles;

N armatures disposed radially about said guide means, each of said armatures being associated with one of said electromagnetic structures to form an electromechanical actuator for transferring electromechanical energy to a stylus, and each of said armatures having a stylus engag-

ing end and an outer end that extends in cantilevered fashion outside of said outer pole;

N styli carried by said guide means, each of said styli being of an elongated rod-like configuration having a head end for engagement by the stylus engaging end of one of said armatures and a printing end for impacting a recording medium when the stylus is propelled through said guide means by one of said actuators;

a unitary connector having a central portion connected to said guide means and N resilient arms extending radially outward therefrom, each of said arms engaging the outer end of one of said armatures for applying a moment of force thereto tending to cause the stylus engaging end to rotate about said outer pole toward said central portion.

3,929,215

PRINTING MECHANISM

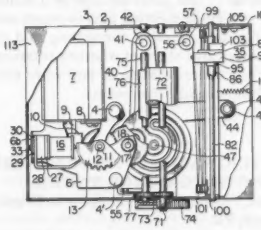
Toshio Hayakawa, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 8, 1974, Ser. No. 513,068

Claims priority, application Japan, Oct. 12, 1973, 48-115241; Oct. 12, 1973, 48-115242; Oct. 12, 1973, 48-115243; Oct. 12, 1973, 48-119322[U]; Oct. 12, 1973, 48-119324[U]; Oct. 12, 1973, 48-119323[U]; Oct. 12, 1973, 48-119325[U]; Oct. 12, 1973, 48-119326[U]; Aug. 20, 1974, 49-99926[U]; Aug. 20, 1974, 49-99927[U]

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **15 Claims**



1. A mechanism for moving a writing unit of a non-impact type along a straight path to scan across each of a plurality of line paths within a sheet of recording paper, comprising, a housing having a bottom wall and a pair of opposing side walls, a support rotatably mounted on said bottom wall, a mangle wheel rotatably mounted on said support and having first and second toothed portions arranged in an outer and an inner arcuate path to form a continuous loop, a gear engaged with said loop of teeth, drive means for driving said gear whereby said mangle wheel is rotated in one direction at a first speed and in the opposite direction at a second speed higher than said first speed, first guide means arranged to guide said writing unit along said straight path, means for connecting said writing unit with said mangle wheel to cause said writing unit to move in opposite directions, second guide means for guiding said recording paper, and means engageable with said support for stepwisely shifting said paper in a direction normal to the direction of movement of said writing unit, when said writing unit moves at said second speed.

3,929,216

INPUT KEYBOARDS

Harvey Einbinder, 308 W. 97th St., New York, N.Y. 10025

Filed Sept. 4, 1973, Ser. No. 394,516

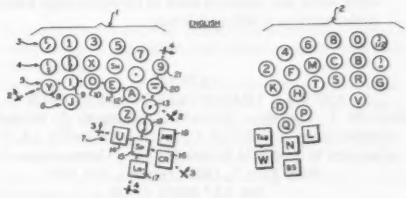
Int. Cl.² B41J *5/10*

U.S. Cl. 197—100 **17 Claims**

1. An input keyboard for the transfer of information to a machine by a human operator, comprising:

a plurality of keys arranged in transversely oriented key rows as viewed by the operator: the number key row being situated at the greatest distance from the operator; the upper letter key row being situated closer to the operator than the number key row; the home key row being situated closer to the operator than the upper letter key row; the lower letter key row being situated closer to the operator than the home key row; and the thumb key row being situated closer to the operator than the lower letter key row;

wherein the upper letter key row comprises twelve keys: six keys on the left hand side of the keyboard as viewed by the operator, and six keys on the right hand side of the keyboard as viewed by the operator;



wherein the home key row comprises twelve keys: six keys on the left hand side of the keyboard as viewed by the operator, and six keys on the right hand side of the keyboard as viewed by the operator;

wherein the thumb key row comprises six keys: three keys on the left hand side of the keyboard as viewed by the operator, and three keys on the right hand side of the keyboard as viewed by the operator;

wherein the keys on the upper letter key row are designated in serial order along the upper letter key row as viewed by the operator from the outer edge of the keyboard from the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first upper letter key, the second upper letter key, the third upper letter key, the fourth upper letter key, the fifth upper letter key, and the sixth upper letter key, respectively; and on the right hand side of the keyboard as viewed by the operator—the seventh upper letter key, the eighth upper letter key, the ninth upper letter key, the tenth upper letter key, the eleventh upper letter key, and the twelfth upper letter key, respectively;

wherein the keys on the home key row are designated in serial order along the home key row as viewed by the operator from the outer edge of the keyboard to the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first home key, the second home key, the third home key, the fourth home key, the fifth home key, and the sixth home key, respectively; and on the right hand side of the keyboard as viewed by the operator—the seventh home key, the eighth home key, the ninth home key, the tenth home key, the eleventh home key, and the twelfth home key, respectively;

wherein the keys on the thumb key row are designated in serial order along the thumb key row as viewed by the operator from the outer edge of the keyboard to the center of the keyboard as follows: on the left hand side of the keyboard as viewed by the operator—the first thumb key, the second thumb key, and the third thumb key, respectively; and on the right hand side of the keyboard as viewed by the operator—the fourth thumb key, the fifth thumb key, and the sixth thumb key, respectively;

wherein the upper and lower case forms of a single letter are assigned to the same key;

wherein space and letter keys are arranged on the left hand side of the keyboard as viewed by the operator as follows: the space key, which generates the separation between

words, is assigned to the second thumb key; one high frequency vowel is assigned to the second home key; a second high frequency vowel is assigned to the third home key; a third high frequency vowel is assigned to the fourth home key; and a fourth high frequency vowel is assigned to the fifth home key; wherein each of these four high frequency vowels is a different letter; and

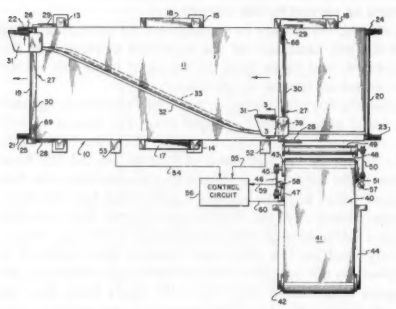
wherein letter keys are arranged on the right hand side of the keyboard as viewed by the operator as follows: one high frequency consonant is assigned to the fifth thumb key; a second high frequency consonant is assigned to the eighth home key; a third high frequency consonant is assigned to the ninth home key; and a fourth high frequency consonant is assigned to the tenth home key; and a fifth high frequency consonant is assigned to the eleventh home key; wherein each of these five high frequency consonants is a different letter.

3,929,217

ARTICLE TRANSFERRING APPARATUS

Franklin J. Thurston, Rockville; Franciscus J. Schendeler, Gaithersburg, and Joseph C. Jounen, Frederick, all of Md., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed June 1, 1973, Ser. No. 366,184
Int. Cl.² B65G *47/00*
U.S. Cl. 198—23 **25 Claims**



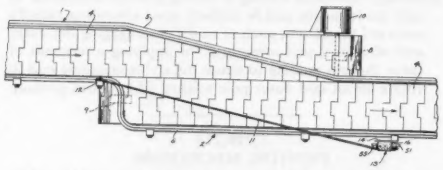
1. Article transferring apparatus comprising article supporting means having an upper surface for supporting an article, first article pushing means associated with said article supporting means for pushing an article in a first direction along the upper surface of said article supporting means, said first article pushing means being movable with respect to said article supporting means, second article pushing means in moving engagement with said first article pushing means for pushing the article in a second direction along the upper surface of said article supporting means, said second article pushing means having projecting means for positively moving said article in said second direction, said second article pushing means being movable with respect to said article supporting means, means operatively associated with said second article pushing means and said article supporting means for causing said second article pushing means to move in a second direction to push the article in a second direction along the upper surface of said article supporting means as said first article pushing means moves to push the article in the first direction along the upper surface of said article supporting means, and means operatively connected to at least one of said article pushing means for driving said first and second article pushing means.

3,929,218

MODULATED SPEED CONTROL FOR A CONVEYING SYSTEM

Robert F. Risley, Wauwatosa, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed May 1, 1974, Ser. No. 465,915
Int. Cl.² B65G *43/08*
U.S. Cl. 198—37 **12 Claims**



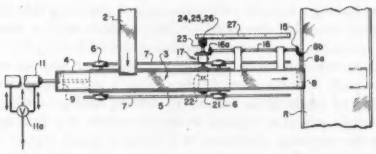
1. An apparatus for moving articles, a first transfer unit for moving articles, a second transfer unit for moving articles, guide means disposed above said transfer units for guiding the articles from the first transfer unit to the second transfer unit, said guide means including a movable guide member associated with a first of said transfer units, said guide member being mounted for movement with respect to the first transfer unit in response to pressure exerted by an accumulation of said articles on said first transfer unit, fluid power-operated drive means operably connected to the second of said transfer units for driving said second transfer unit, control means for controlling the flow of fluid to said drive means and including a rotary valve element, a rotatable member means connecting said rotatable member to said guide member in a manner such that movement of said guide member acts to rotate said rotatable member, and means operably connecting said rotatable member to said rotary valve element whereby rotation of said rotatable member will cause rotation of said valve element to vary the flow of fluid to said drive means.

3,929,219

RECIPROCATING VARIABLE SPEED MATERIAL TRANSFER CONVEYOR SYSTEM

Donald B. Malcolm, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,415
Int. Cl.² B65G *21/12*
U.S. Cl. 198—111 **15 Claims**



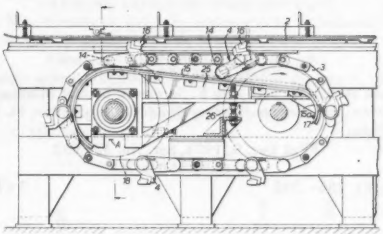
10. A system wherein material is carried from a source at a substantially constant rate to a point of discharge at which point it is delivered onto a shuttle conveyor which has a discharge end, which shuttle conveyor is reciprocated transversely to said point of discharge and from which shuttle conveyor material is in turn discharged onto a receiving area across which the discharge end of the conveyor moves, said shuttle conveyor comprising a carriage and means for effecting reciprocation thereof relative to the ground and a single belt conveyor having upper and lower runs both of normally fixed length entirely mounted on and fixed against movement relative to the carriage along with a driving means for operating the conveyor at a predetermined speed relative to the ground when the carriage is stationary, the upper run of the belt conveyor being arranged to receive material directly to said point of discharge, and means on the carriage responsive to its movement back and forth relative to the ground for

varying the speed of travel of the belt conveyor to decrease its speed relative to the carriage when the carriage is moving in one direftion and increasing its speed when the carriage is moving in the reverse direction.

3,929,220
PALLET CONVEYOR HAVING RELATIVELY ADJUSTABLE PUSHER HEADS

William Roy Powel, Leatherhead, England, assignor to Powel International Limited, England

Filed July 15, 1974, Ser. No. 488,407
Claims priority, application United Kingdom, July 26, 1973, 35706/73
Int. Cl.² B65E *15/14*
U.S. Cl. 198—164 **6 Claims**



1. A conveyor for a tile making machine, the conveyor comprising:

frame means defining a pallet track for receiving and supporting a line of end-to-end pallets to be conveyed;

a drive chain mounted for movement adjacent said pallet track;

said drive chain including a linear driving run which extends in the direction of said track;

a plurality of pushers carried by said drive chain in spaced relation therealong, each pusher being pivotally coupled to the chain and including:

a head portion for engaging and pushing a contact surface of a pallet to advance the line of pallets, and

a follower portion;

a follower track disposed adjacent at least a substantial portion of the driving run of said chain and being arranged to support and guide the follower portions of pushers traveling along said driving run in driving engagement with the pallets;

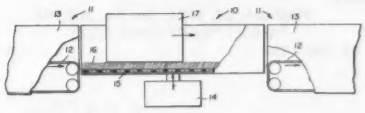
said follower track being angularly inclined relative to said driving run in a manner for guiding said follower portions for rotational movement relative to said chain to rotate said head portions in a direction opposed to the direction of travel of said driving run, so that with the chain being driven at constant speed the head portions advance the line of pallets at a constant speed less than the speed of the driving run; and

adjustment means operably connected to said follower track for adjusting the inclination angle of said follower track relative to said driving run so as to vary the distance between the head portion of a pusher located at the beginning of the track and the head portion of a pusher disposed on the track to accommodate different length pallets and changes in effective chain length.

3,929,221
PAPER SHEET CONVEYOR

Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

Filed Apr. 11, 1974, Ser. No. 460,128
Int. Cl.² B65G *27/00*
U.S. Cl. 198—220 BA **2 Claims**



1. A conveyor for moving paper sheets on edge along a predetermined path established by a feed element, said conveyor comprising:

a. the upper surface of said feed element having pile material with resilient bristles inclined from the vertical toward the direction of feed along said path;

b. means for vibrating said feed element to move said bristles repeatedly against the bottom edges of said paper sheets to move said paper sheets along said path in said direction of feed;

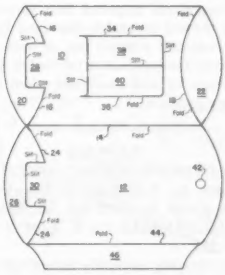
c. the tips of said bristles being at a uniform height and having surfaces angled relative to said bristle inclination angle to extend under and support said bottom edges of said paper sheets on said angled surfaces to prevent said paper sheets from slipping down between said bristles; and

d. said tips of said bristles being bent transversely of said direction of feed to form said angled surfaces.

3,929,222
PILLOW BOX BLANK

William Paul Smith, Anaheim, and Glen Matsuyama, Los Angeles, both of Calif., assignors to Graphic Arts Packaging Corporation, Gardena, Calif.

Filed Oct. 29, 1974, Ser. No. 518,407
Int. Cl.² B65D *5/50, 25/54*
U.S. Cl. 206—45.14 **5 Claims**



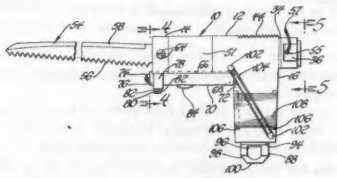
1. A one-piece blank for forming an ellipsoidal-shaped pillow-pack carton having a first panel and a second panel, each panel having arcuately-shaped ends, said panels being separated by a scoreline extending from one of their ends to the other, one of the panels having arcuately-shaped scorelines at the first and second ends thereof each forming an ellipse with the corresponding arcuately-shaped end, and the other of the panels having an arcuately-shaped scoreline at the first end thereof forming an ellipse with the corresponding arcuately-shaped end, and each of the panels having transversely spaced slits therein at the first end thereof interrupting and extending outwardly from the corresponding arcuately-shaped scoreline into the corresponding ellipse and intercon-

nected therein to define spaced and parallel support pedestals for the carton when the arcuately-shaped ends are folded about the corresponding scorelines.

3,929,223
SELF-CONTAINED SURVIVAL DEVICE

Russell S. Ludeman, 982 Miller Road, Lake Orion, Mich. 48035

Filed July 23, 1974, Ser. No. 381,904
Int. Cl.² B65D *69/00, 85/28*
U.S. Cl. 206—234 **6 Claims**



1. A survival device, comprising a substantially L-shaped single-piece body having discreet first and second legs disposed and joined substantially at right angles to one another so that each of said legs has one free end and one end jointed to said other leg, each of said first and second legs having removably associated with said free end thereof at least one survival tool that requires, for efficient use thereof, use of said second and first legs, respectively, as the handle therefor, each of said legs being formed lengthwise thereof to provide a storage chamber therein, each of said storage chambers having one permanently-closed bottom end and one open end with removable means for sealing the same, the chamber of said second leg opening at the free end of said second leg and the chamber of said first leg opening at the end thereof joined to said second leg, whereby said closed bottom end of said chamber of said second leg is disposed adjacent but spaced from said open end of said chamber in said first leg and said closed bottom end of said chamber of said first leg is spaced from said free end of said first leg, said chambers being internally threaded and said chamber sealing means comprising externally threaded plugs threadable into said chambers, said plugs having oppositely disposed flats formed on the outer circumference thereof to enable the same to be more easily removed and replaced without use of tools, and said plugs being hollow from the inner ends thereof so as to increase the length and volume of said chambers when said plugs are in chamber-sealing position.

3,929,224
CLOTHES-CARRYING ASSEMBLY

Charles A. Smith, Jr., P.O. Box 574, Norwich, N.Y. 13815

Filed Sept. 9, 1974, Ser. No. 504,300
Int. Cl.² B65D *85/18;* **A45C** *7/00*
U.S. Cl. 206—287 **13 Claims**

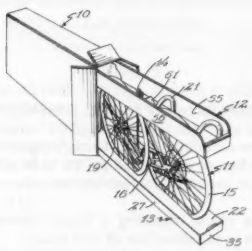
1. A clothes-carrying assembly for carrying a suitcoat and trousers in a wrinkle-free manner within a protective covering, comprising, in combination: a male clothes-hanger having an upper hook portion, sloping upper shoulder portions and a lower cross-bar portion; a generallyrectangular back-panel having attachment means adjacent an upper edge of said back-panel looped around said lower cross-bar portion of said hanger for removably suspending said back-panel from said cross-bar portion of said hanger and retaining said upper edge of said back-panel substantially parallel to said cross-bar portion if said hanger is tilted, said back-panel having a plurality of pockets attached thereto, said back panel having a width substantially equal to the width of said hanger and at least one seam extending laterally across said back-panel to stiffen said back-panel in a lateral sense and resist lateral crushing of said back-panel; said trousers being suspended over said cross-bar portion, said suitcoat being suspended over said shoulder portions of said hanger with an upper portion of said back-panel extending within said suitcoat to prevent lateral crush-

ing of said suitcoat; and an outer substantially flexible garment bag surrounding said back-panel, trousers and suitcoat, with said hook portion of said hanger protruding from said garment bag.

3,929,225
SHORT BICYCLE PACK

Frank W. Locke, and John F. Sorenson, both of Minneapolis, Minn., assignors to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Dec. 9, 1974, Ser. No. 531,052
Int. Cl.² B65D *85/68*
U.S. Cl. 206—335 **3 Claims**



1. A package for shipping and storing a partially disassembled bicycle of the type having a frame with a rear wheel mounted thereto, a sprocket wheel and chain, a front wheel support member at the front of said frame in the form of a fork, with handle bars, pedals, and a front wheel being removed from said frame, said front wheel positioned to one side of said fork toward said rear wheel to form a shortened package, said container made of foldable sheet-like material and comprising:

a lower die cut tray having downwardly extending side walls;

an upper die cut tray having upwardly extending side walls; said upper and lower trays having first die cut elongate openings formed therein and positioned with the edges of said openings in engagement with a portion of the circumference of said rear wheel of said bicycle;

said elongated openings being parallel and in angular relationship to the sides of said trays;

said bicycle frame and said rear wheel being positioned angularly within said container to allow said front wheel to be located at one side of said frame;

said upper and lower trays having formed therein second parallel elongated openings engaging a portion of the circumference of said front wheel;

said upper tray having formed therein openings with said handle bars positioned with a portion of said handle bars extending downwardly through said openings in said upper tray;

said upper die cut tray having formed therein a third opening, the edges of said third opening engaging a portion of said frame;

said lower die cut tray having formed therein a fourth opening, the edges of said fourth opening engaging a portion of the circumference of said sprocket wheel and chain attached to said frame;

said lower die cut tray having a pair of fifth openings formed therein and at one end thereof, the edges of said fifth openings engaging the lower ends of said fork of said frame, a first of said downwardly extending end walls in said lower die cut tray having attached thereto a horizontally positioned support flap on which the lower end of said fork is positioned; and

an enclosing box structure completely surrounding said bicycle and said trays.

3,929,226

PACKING COILS OF WIRE NETTING

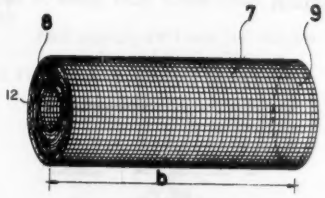
Marc Nijs, Harelbeke, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed June 25, 1974, Ser. No. 482,900

Claims priority, application United Kingdom, July 3, 1973, 31631/73

Int. Cl.² B65D *65/02, 85/67*

U.S. Cl. 206—410 **6 Claims**



1. A package comprising:

a wire netting coil,

a protective end cover on each end of said coil,

said cover having a tongue hingedly connected thereto and extending into said coil,

said tongue being in sufficient independent frictional engagement with said coil to keep said end covers in place, said frictional engagement being accomplished independently of any additional element, and

a sheet tightly enclosing said coil and said end covers,

said end covers acting to prevent puncturing or damaging of said enclosing sheet by the end wires of said coil.

3,929,227

METHOD OF PACKAGING TUBULAR STENCILS

Roy Stonier Burdis, Tarporley, England, assignor to Screentex Limited, St. Helens, England

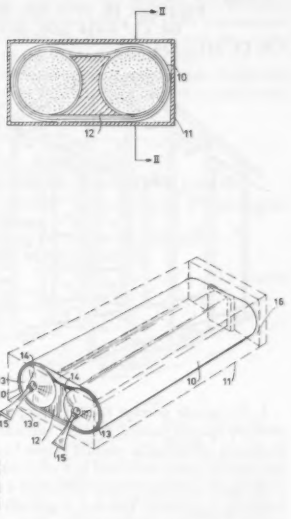
Filed Feb. 11, 1974, Ser. No. 441,440

Claims priority, application United Kingdom, Mar. 2, 1973, 10227/73

Int. Cl.² B65D *85/30, 81/12;* **B65B** *19/00*

U.S. Cl. 206—446 **8 Claims**

1. A transit package having packed within it at least one screen printing cylinder reinforced internally by two expansible bags, filled with material in particulate form, in spaced parallel relationship and a reinforcing block located between the expansible bags so as to occupy any space therebetween when the latter are filled, forming a substantially rigid body



which bears firmly against the wall of the cylinder or against a part or parts thereof.

3,929,228

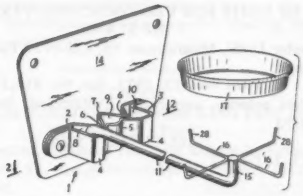
ADJUSTABLE BRACKET ASSEMBLY

Efraim Margolin, and Michael Grunstein, both of New York, N.Y., assignors to Grun Mar Industries, Inc., New York, N.Y.

Division of Ser. No. 382,459, July 25, 1973, Pat. No. 3,888,354. This application Mar. 21, 1975, Ser. No. 560,325

Int. Cl.² A47F *5/08*

U.S. Cl. 211—102 **5 Claims**

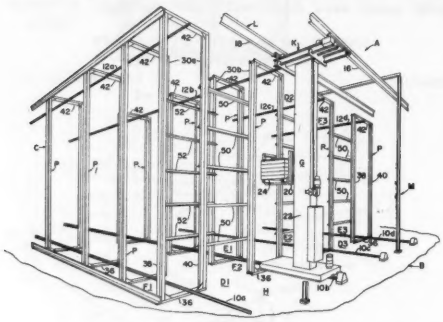


1. A bracket assembly comprising a front plate and a back plate, said plates being adjustably connected to each other adjacent their ends, at least a first forward section on said front plate, a recessed section on said front plate adjacent said first forward section, a projecting section on said back plate, a rear section on said back plate adjacent said first projecting section, a first opening defined by said first forward section and said first projecting section, a second opening defined by said recessed section and said rear section, a support member frictionally held in said second opening, a first rod in said first opening.

3,929,229
ARTICLE STORAGE FACILITY

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Sept. 10, 1973, Ser. No. 395,619
Int. Cl.² A47F 5/00; B65G 1/06
U.S. Cl. 211—134 **1 Claim**

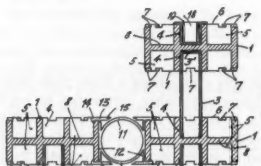


1. An article storage facility comprising: at least two horizontally spaced parallel rows of vertically positioned, parallel, duplicate, rectangular picture frame-like members spaced one behind the other; each said row of picture frame-like members forming an aisle for the movement of a power-operated article handling apparatus therein; a plurality of vertically spaced article supports spanning the space between said parallel rows of picture frame-like members comprising generally horizontal members connected at one end to vertical sides of said picture frame-like members of one row of picture frame-like members and at their other ends to adjacent vertical sides of picture frame-like members of a second row of picture frame-like members adjacent to said first row of picture frame-like members and which picture frame-like members are in the same vertical plane as the plane of the picture frame-like member of said one row of adjacent picture frame-like members to which the generally horizontal members are connected; and rail members in said aisle of each row rows of picture frame-like members connected to top and/or the bottom sides thereof for supporting a power-operated article handling apparatus therein.

3,929,230
SETS OF UNITS FOR CONSTRUCTING VARIOUS TYPES OF STAND

Hanspeter Luthi, Maurstrasse 58, CH-8117 Fallanden, Switzerland

Filed Nov. 12, 1973, Ser. No. 415,195
Claims priority, application Switzerland, Nov. 10, 1972, 16372/72
Int. Cl.² A47F 5/10
U.S. Cl. 211—177 **8 Claims**



1. A set of units including holding units, plug-in units, and connecting units for the construction of various types of stands comprising:

each said holding unit defining on opposite sides thereof receptacles for selectively receiving an article such as a plant, candle or the like or for alternatively receiving a tubular plug-in unit,

each said tubular plug-in units having an end portion and means for retention of said plug-in unit in said receptacle of a respective holding unit to permit thereby the detachable connection of a plurality of said holding units in stacked relation one above the other,

each said holding unit further defining on its said opposite sides recesses adjacent its periphery for receiving a portion of one of said connecting units,

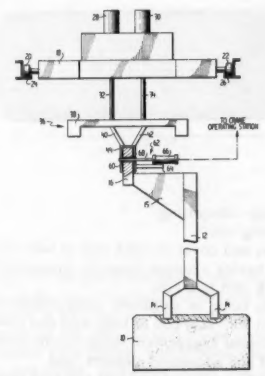
each said connecting unit including opposed web portions each of which is adapted to lie against an outer surface of a respective holding unit, each said web portion at its ends supporting transverse shanks having catches on one side of the web for fitting into said recesses on the opposite sides of a holding unit, and grips on the other side,

whereby said transverse shanks are resiliently pivoted on said grips to permit said catches to engage said recesses to engage a holding unit so that a plurality of said holding units can be interconnected in a generally coplanar relationship.

3,929,231
ANODE CARRIER LIFTING DEVICE

Henry S. Cook, Owensboro, Ky., assignor to Southwire Company, Carrollton, Ga. and National Steel Corporation, Pittsburgh, Pa.

Filed July 31, 1974, Ser. No. 493,483
Int. Cl.² B66C 17/06
U.S. Cl. 212—11 **7 Claims**



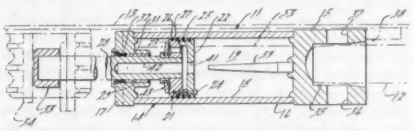
1. In combination with a carbon anode having an anode shaft extending therefrom, means for lifting and carrying said anode comprising first coupling means carried by a superstructure extending from an overhead crane, said first coupling means and said cooperating coupling means having openings formed therein which are adapted to be concentrically aligned when in coupled relation, means carried by said cooperating coupling means adapted to be extended through said concentrically aligned openings for joining said coupling means in coupled relation, means for actuating said means for joining said coupling means in coupled relation, and wherein said actuating means is operatively connected to the operating station of said crane whereby the crane operator may selectively advance and retract said joining means.

3,929,232

END OF CAR CUSHIONING UNIT

William K. MacCurdy, Plymouth, Mich., assignor to Evans Products Company, Plymouth, Mich.

Filed Aug. 13, 1973, Ser. No. 388,330
Int. Cl. B61g 11/12
U.S. Cl. 213—43 14 Claims



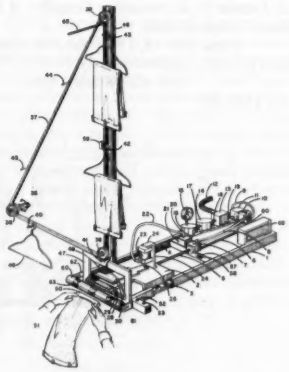
1. An end of car cushioning unit adapted to be interposed between a coupler and a car frame of a railway car for damping shock forces, said cushioning unit comprising a cylinder, a piston received within said cylinder, said piston and said cylinder defining a chamber adapted to receive a fluid, primary metering means in communication with said chamber for passing fluid therethrough at a restricted rate upon relative movement of said piston and said cylinder, and pressure responsive valve means in series flow arrangement with said primary metering means for precluding the flow of fluid through said primary metering means until a predetermined force is applied to said cushioning unit.

3,929,233

PANTS HANGING APPARATUS

Lawrence V. Drace, 6928 Acoma Court, Las Vegas, Nev. 89128

Filed June 25, 1974, Ser. No. 483,050
Int. Cl.² B65G 37/00
U.S. Cl. 214—1 R 7 Claims



1. Apparatus for threading a pair of trousers on a clothes hanger comprising in combination with a clothes hanger:

a frame;

clamp means for receiving the cuffs of a pair of trousers carried by said frame, said clamp means being movable between a first position near the front of the frame and a second position;

activating means for securing the cuffs of a pair of trousers in said clamp means when the clamp means is in the first position and deactivating means for releasing said cuffs from the clamp means when the clamp means is in the second position;

drive means for moving said clamp means between said first and second positions;

support means for positioning said clothes hanger adjacent said first position such that the trousers are threaded through said clothes hanger when the cuffs are engaged in the clamp means in the first position and the clamp means is moved to the second position; and

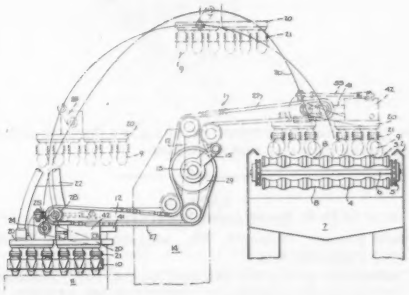
transport means for removing said hanger away from said first position after the trousers have been threaded on the hanger.

3,929,234

ARTICLE TRANSFER AND SPACER MEANS

William H. Warren, Omaha, Nebr., assignor to Henningsen Foods, Inc., White Plains, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,023
Int. Cl.² B65G 47/26
U.S. Cl. 214—1 BV 12 Claims



1. In an article transfer device for picking up and for carrying an array of articles from a pick-up position to an article placement position and including article supporting means and lifter members for moving the supporting means between said positions the improvement comprising:

said supporting means comprising a plurality of rows of individual lifter plates with a plurality of lifter plates in each row;

means for changing the spacing between individual lifter plates in each row during the movement of the supporting means between said positions; and

means for simultaneously changing the spacing between said rows of lifter plates.

3,929,235

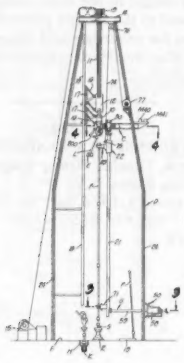
SYSTEM FOR HANDLING AND RACKING PIPE IN THE HOLD OF A VESSEL

James A. Howard, Houston, Tex., and Robert R. Kelly, Hoffman Estates, Ill., assignors to Byron Jackson Inc., Long Beach, Calif.

Filed Nov. 22, 1974, Ser. No. 526,207
Int. Cl.² E21B 19/02
U.S. Cl. 214—2.5 18 Claims

1. Well pipe handling apparatus comprising: a derrick having a floor provided with an opening for receiving lengths of well pipe in generally vertically disposed racked positions, crane means aloft in said derrick having support means shiftable in opposite directions laterally of said derrick and towards and away from the center of said derrick, means for shifting said support means, a guide post depending from said support means, positioning means adjacent to the lower end of said guide post for moving the lower end of said guide post laterally and towards and away from the center of the derrick, pipe engaging guide means also adjacent to the lower end of said guide post, pipe supporting means releasably engageable

with a length of pipe and vertically shiftable on said guide post for raising and lowering the lengths of pipe in said pipe engaging guide means, and means for lifting and lowering said pipe supporting means on said guide post.



3,929,236

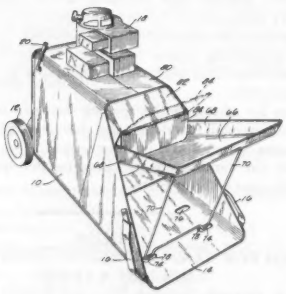
SHREDDING MACHINE

Daniel Koturov, Plymouth, Wis., assignor to Gilson Brothers Co., Plymouth, Wis.

Continuation of Ser. No. 386,690, Aug. 8, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,297

Int. Cl.² B02C *13/14*

U.S. Cl. 241—55 **16 Claims**



1. A shredding machine comprising a hollow cylindrical shredder drum, a shaft coaxially journalled within said drum, at least one shredding blade attached to said shaft and projecting radially therefrom, means for rotating said shaft and said shredding blade, an inlet opening at the upper end of said drum and intersected by the axis of said shaft, a discharge opening at the lower end of the drum and intersected by the axis of said shaft, said shaft having no blade closer to the input opening than said one blade, said one shredding blade being spaced from the inlet opening to provide a material recirculation zone in the drum above the blade, the axis of said drum and said shaft being inclined at an acute angle to the horizontal whereby the drum is tilted to elevate portions of the discharge opening and promote discharge of shredded material from the drum.

3,929,237

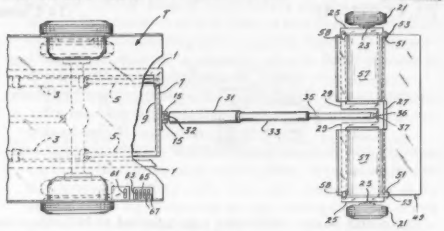
SELF-STORING DOLLY

Alvin C. Schaedler, 1005 N. 17th St., Belleville, Ill. 62223

Filed Feb. 13, 1974, Ser. No. 442,070

Int. Cl.² B60P *3/12*

U.S. Cl. 214—86 A **5 Claims**



1. In combination with a vehicle having a chassis, a two-wheel dolly, structure for coupling said dolly to said chassis, means extensibly and retractably mounting said structure on said chassis for movement between a stored ground elevated inoperative position substantially forward of the rear end of said chassis and an operative position near the rear end of said chassis, a telescoping draft tongue pivotally connected at its forward end to said coupling structure and at its rear end to said dolly and being extensible from its stored fully-telescoped condition wherein its rear end and said dolly are near the rear of said chassis when said coupling structure is in its stored position and its fully extended condition wherein said dolly is spaced a substantial distance rearwardly from said chassis.

3,929,238

EQUIPMENT FOR SUPPLYING CONTAINERS FILLED WITH CIGARETTES TO THE SUPPLY HOPPER CHARGING MECHANISM OF CIGARETTE PACKETING MACHINES

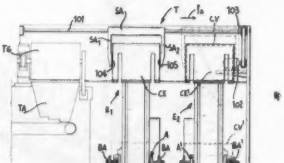
Ariosto Seragnoli, deceased, late of Bologna, Italy, by Elazar Romano, legal representative, Bologna, Italy, assignors to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli, Italy

Filed Dec. 10, 1973, Ser. No. 423,179

Claims priority, application Italy, Mar. 1, 1973, 3343/73

Int. Cl.² B60B *17/00*

U.S. Cl. 214—89 **7 Claims**



1. Apparatus for moving cigarette containers to and from a supply hopper charging mechanism of a cigarette packeting machine, comprising;

first and second conveyor means for, respectively, approximately horizontally moving uniform containers, filled with cigarettes, to a first lower rest position, and similarly removing such containers, which have been emptied of cigarettes, from a second lower rest position;

first and second trolley means for respectively and cyclically, first, receiving the filled containers in the first lower rest position and lifting them to a first upper rest position for transfer to a supply hopper charging mechanism of a cigarette packeting machine and, second, receiving the

emptied containers in a second upper rest position and lowering them to the second lower rest position for return to the second conveyor means;

pusher-follower means for cyclically transferring the filled containers from the first upper rest position to the hopper charging mechanism and cyclically transferring the emptied containers from the hopper charging mechanism to the second upper rest position; and

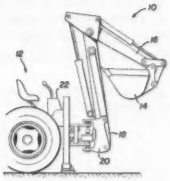
container holding means operable in synchronism with the trolley and pusher-follower means for releasably gripping and holding successive containers on the first and second conveyor means in respective positions each horizontally spaced from the respective trolley means and contiguous to the respective lower rest position, to enable smooth upward transfer of one container from the respective lower rest position by the respective trolley means, and smooth downward transfer of another container by the respective trolley means to the respective lower rest position free of interference by the moving and removing of other containers on the respective conveyor means.

3,929,239

BACKHOE ACTUATOR

John Frederick Shumaker, Mount Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 25, 1974, Ser. No. 464,288
Int. Cl.² F16H *27/02*; B66F *9/02*
U.S. Cl. 214—138 R **10 Claims**



1. In a backhoe having a generally vertical support attachment, a swing tower having a pair of interconnected, vertically spaced support members, one of said support members being pivotally connected to said support attachment about a generally vertical pivot axis, a backhoe boom operably mounted on said swing tower for earth working, the improvement of means for pivoting said swing tower relative to the support attachment including a hydraulic motor actuator having an output component driving a planetary gear reducer said planetary gear reducer having a rotary power output shaft coaxial with said vertical swing tower pivot axis and nonrotatably connected to the other of said support members, said hydraulic motor actuator and planetary gear reducer being nonrotatably connected to said support attachment and being nested between the vertically spaced swing tower support members so that the moment arm from the backhoe center of gravity to the support attachment may be reduced.

3,929,240

SHAFT FURNACE CHARGING PROCESS

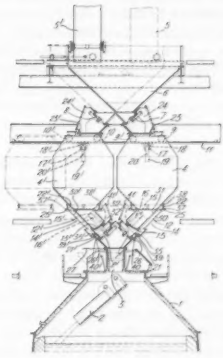
Edouard Legille, Luxembourg, and René N. Mahr, Howald-Hesperange, both of Luxemburg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxemburg

Continuation-in-part of Ser. No. 374,089, June 27, 1973, abandoned. This application Jan. 22, 1975, Ser. No. 543,177
Claims priority, application Luxemburg, July 7, 1972, 65660
Int. Cl.² F27B *1/20*
U.S. Cl. 214—152 **5 Claims**

1. A process for charging a shaft furnace, the furnace having a hearth and side wall, the furnace having a rotatable and angularly adjustable charge distribution chute centrally mounted therein, the chute being supplied with charge material from a storage hopper and the furnace installation including means for adjusting the quantity of material delivered from the storage hopper to the chute per unit of time, the process including the steps of:

rotating the charge distribution chute at constant speed;

supplying a constant quantity of charge material per unit of time to the rotating distribution chute to thereby deliver



the charge material to the furnace hearth along an arcuate path; and

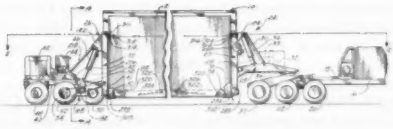
varying the pitch angle of the rotating distribution chute relative to the blast furnace central axis in uneven steps in order to convert the constant charge material applied per unit of time into a constant charge quantity per unit of furnace hearth cross-section, the magnitude of said pitch angle step variations increasing in the direction of vertical chute orientation.

3,929,241

TRANSPORT RIG

Alvin A. Putnam, San Antonio, Tex., assignor to H. B. Zachry Co., San Antonio, Tex.

Continuation-in-part of Ser. No. 164,524, Aug. 21, 1971, abandoned. This application Aug. 8, 1973, Ser. No. 386,838
Int. Cl.² B60P *3/40*
U.S. Cl. 214—390 **17 Claims**



1. A transport rig for moving a load having a first and a second end, the transport rig comprising

a first load support frame having means on it for carrying the first end of the load,

a second load support frame having means on it for carrying the second end of the load,

a first wheel frame for supporting a first set of wheels resting on the ground forward of the first load support frame,

a first frame support attached to the first wheel frame and extending toward the load for pivotal attachment to the first load support frame so as to maintain the carrying means of the first load support frame above the ground and so that the first frame support is able to pivot about

a substantially horizontal axis through its point of attachment to the first load support frame,

a second wheel frame for supporting a second set of wheels resting on the ground behind the second load support frame,

a second frame support attached to the second wheel frame and extending toward the load for pivotal attachment to the second load support frame so as to maintain the carrying means of the second load support frame above the ground and so that the second frame support is able to pivot about a substantially horizontal axis through its point of attachment to the second load support frame,

an extendible and contractible first actuating arm extending from the first load support frame to a point on the first frame support spaced from the support's point of attachment to the first load support frame, the first actuating arm being operative to pivot the first frame support about its horizontal axis to raise or lower the first end of the load,

an extendible and contractible second actuating arm extending from the second load support frame to a point on the second frame support spaced from the support's point of attachment to the second load support frame, the second actuating arm being operative to pivot the second frame support about its horizontal axis to raise or lower the second end of the load, and

means for securing the first and second load support frames together comprising an elongated flexible cable engaged with tension adjusting means on the first load support frame for paying out or reeling in the cable, the cable extending from the tension adjusting means directly into engagement with guide means on the first load support frame independently of the first wheel support frame or the first frame support means and then to a point of attachment on the second load support frame independently of engagement with the second wheel support frame of the second frame support means so that the adjustment of the tension adjusting means can shorten the effective length of the cable to squeeze the first and second ends of the load between the first and second load support frames, respectively, and so that raising or lowering of the load can be done independently of the adjustment of the tension in the cable,

whereby the transport rig and the load may be transported as a unit under power supplied by a towing vehicle coupled to either of the wheel support frames.

3,929,242

VERTICAL LIFT CRANES

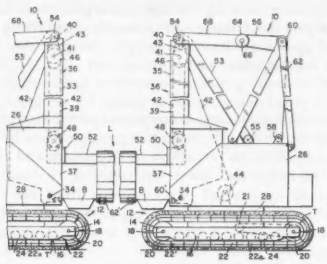
Edward C. Sawyer, 9200 River Valley Drive, Brighton, Mich. 48116

Continuation-in-part of Ser. No. 333,475, Feb. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,620, Oct. 5, 1971, abandoned. This application Aug. 2, 1974, Ser. No. 493,871

Int. Cl.² B60P *3/42*

U.S. Cl. 214—390 **7 Claims**

1. Lifting and transporting apparatus comprising a pair of cranes disposed in spaced relation to one another, said cranes being track-laying vehicles each having a ground engaging base and provided with endless tracks supporting the same for movement over the ground, each crane also having a boom and the cranes disposed with their booms facing one another, said boom of each crane being of the gallows or A-frame type comprising a pair of elongated laterally spaced boom members joined at their upper ends by a transverse member and pivotally supported at their lower ends within the area of ground engagement of said tracks, means holding the boom of each crane in a position extending substantially vertically upwardly within the area of ground engagement of said tracks, load-supporting means suspended from the connecting transverse member of each boom by flexible linear members to support one end of a load disposed between said cranes, means for taking in and paying out said flexible linear members to raise and lower said load-supporting means, each crane having a tow bar adapted to be releasably connected to the



load, said tow bars having pivotal connections to said cranes permitting swinging movement from an operative, forwardly extended position to an inoperative position, and pneumatic tires for said endless tracks.

3,929,243

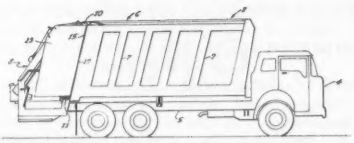
REFUSE COLLECTION APPARATUS

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 264,021, June 19, 1972. This application Feb. 8, 1974, Ser. No. 440,796

Int. Cl.² B60P *1/00*

U.S. Cl. 214—518 **39 Claims**



1. In a refuse collector including a storage body, a loading hopper positioned rearwardly of and adjacent to an opening in said body, an upper packing panel mounted above and longitudinally of said hopper for up and down movement with respect to said hopper, and a lower packing panel having an upper edge pivotally connected to the lower edge of said upper packing panel for forward and rearward rotation with respect to said hopper; apparatus comprising:

a first hydraulic means operably connected to said upper packing panel to provide up and down movement of said panel;

a second hydraulic means operably connected to said lower packing panel to provide forward and rearward rotation of said lower panel;

said second hydraulic means providing a relatively quick rotation of said lower panel in a rearward direction with a relatively low rotational force exerted on said panel and a relatively slow rotation of said lower panel in a forward direction with a relatively high rotational force exerted on said panel;

a first feed means to feed hydraulic fluid to said second hydraulic means to rotate said lower panel in a rearward direction and to hold said panel in a rearward position;

a second feed means to feed hydraulic fluid to said first hydraulic means while withdrawing hydraulic fluid from said first hydraulic means and combining the withdrawn fluid with the fluid feed to provide a regenerative loop to said first hydralic means to thereby cause a relatively quick downward movement of said upper panel and to hold said upper panel in a lowered position;

a third feed means to feed hydraulic fluid to said second hydraulic means to rotate said lower panel in a forward direction and to hold said lower panel in a forward position;

a fourth feed means to feed hydraulic fluid at a relatively high pressure to said first hydraulic means to move said upper packing panel in an upward direction to move refuse through said opening into said body;

an ejection panel positioned within said body;

said ejection panel being progressively moved away from said opening as refuse is packed against said ejection panel during upward movement of said upper packer panel;

a third hydraulic means to move said ejection panel;

sump means for receiving hydraulic fluid from said fourth feed means and said third hydraulic means;

control means regulating the flow of hydraulic fluid from said fourth feed means and said third hydraulic means to said sump means; and

said control means set to operate at a predetermined pressure of hydraulic fluid in said fourth feed means to momentarily dump hydraulic fluid to said sump from said fourth feed means and said third hydraulic means until the pressure of hydraulic fluid in said fourth feed means is reduced below said predetermined pressure,

whereby the movement of said upper packing panel and said ejection panel are interrelated to provide relatively high and constant compaction pressure during packing of refuse against said ejection panel.

3,929,244

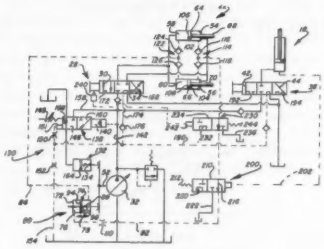
MATERIAL HANDLING VEHICLE

George A. Ekstrom, Churchville, Pa., assignor to Eaton Corporation, Ohio

Filed Apr. 22, 1974, Ser. No. 462,796

Int. Cl.[2] B66F 9/20

U.S. Cl. 214—674 **18 Claims**



12. A vehicle comprising a base, an upstanding mast connected with said base, load engaging means connected with said mast and movable therealong for engaging and lifting a load, tilt motor means for moving said mast and load engaging means relative to said base in such a manner as to vary an overturning moment to which said vehicle is subjected by a load engaged by said load engaging means, said tilt motor means including first and second chambers, variable displacement pump means including load responsive displacement control means for supplying fluid under pressure to said first chamber of said motor means, said tilt motor means including means for subjecting fluid in said second chamber to forces which vary as a function of variations in the overturning moment to which the vehicle is subjected and as a function of variations in the fluid pressure in said first chamber, actuator means operable to vary the displacement of said pump means, further said displacement control means is operable to position said actuator means in response to the pressure differential between the variable displacement pump output and the input pressure to said first chamber and comparator means for comparing the fluid pressures in said first and second chambers independent of said load responsive displacement control means and effecting operation of said actuator means independent of said load responsive displacement control means to reduce the displacement of said pump means when the fluid pressure in said second chamber exceeds the fluid pressure in said first chamber by a predetermined amount.

3,929,245

DEVICE FOR SETTING THE INCLINATION OF THE BUCKET IN A BULLDOZER

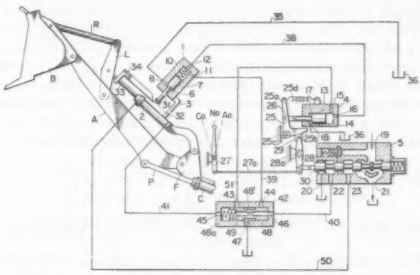
Kazuo Inoue, Tokyo, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 25, 1974, Ser. No. 482,854

Claims priority, application Japan, Nov. 7, 1973, 48-124369; Nov. 7, 1973, 48-124370

Int. Cl.[2] E02F 3/64

U.S. Cl. 214—764 **3 Claims**



1. Device for setting the inclination of a bucket of a bulldozer comprising a tiltable bucket, a bucket tilting cylinder piston assembly having a bottom side chamber and a head side chamber and connected to said bucket for tilting the same upwards when said bottom side chamber is pressurized by working fluid while said bucket is tilted downwards when said head side chamber is pressurized, a piston pump operatively coupled with said bucket tilting cylinder-piston assembly such that the head side chamber of said piston pump is pressurized when said bucket tilting cylinder-piston assembly moves to a position to tilt said bucket upwards to a predetermined position, the bottom side chamber thereof communicating with a sump of working fluid, an actuator cylinder-piston assembly with its head side chamber communicating with the head side chamber of said piston pump, wherein the head side chamber of said actuator cylinder-piston is pressurized when the head side chamber of said piston pump is pressurized, a detent lever connected to said actuator cylinder-piston assembly said detent lever being moved by the movement of the piston of said actuator cylinder-piston assembly, an actuator valve having a movable spool therein and connected to a source of working fluid said actuator valve communicating with said head side chamber and said bottom side chamber of said bucket tilting cylinder-piston assembly for actuating said bucket tilting cylinder-piston assembly to tilt said bucket upwards and downwards by the actuation of said spool, a switching lever connected to said spool of said actuator valve said switching lever being engageable with said detent lever, an operating handle connected to said switching lever for actuating said switching lever such that, when said handle is operated to move said spool in a position for actuating said bucket tilting cylinder-piston assembly to tilt said bucket upwards, said detent lever is engaged with said switching lever for maintaining said spool in said position for tilting said bucket upwards, while, when said piston pump is actuated by said bucket tilting cylinder-piston assembly, said piston pump actuates said actuator cylinder-piston assembly such that said detent lever is disengaged from said switching lever thereby permitting said spool to move to the neutral position thereof for terminating the actuation of said bucket tilting cylinder-piston assembly to automat-

ically set the inclination of said bucket, and a bypass valve having a movable throttle member therein, said bypass valve being connected between said head side chamber of said bucket tilting cylinder-piston assembly and said actuator valve, said bypass valve communicating with said head side chamber of said piston pump and said head side chamber of said actuator cylinder-piston assembly, said movable throttle member being adapted to be moved to a first position to shut off the communication of said head side chambers of said piston pump and said actuator cylinder-piston assembly with said bypass valve when said bottom side chamber of said bucket tilting cylinder-piston assembly is pressurized to tilt said bucket upwards thereby maintaining said head side chambers of said piston pump and said actuator cylinder-piston assembly in pressurized condition and said movable throttle member being adapted to move to a second position to establish the communication of said head side chambers of said piston pump and said actuator cylinder-piston assembly with said bypass valve thereby communicating said head side chamber of said piston pump with said head side chamber of said bucket tilting cylinder-piston assembly and communicating said head side chamber of said actuator cylinder-piston assembly with said sump of working fluid through said bypass valve, when the head side chamber of said bucket tilting cylinder-piston assembly is pressurized, whereby said head side chambers of said piston pump and said actuator cylinder-piston assembly are at all times in a pressurized condition.

3,929,246

PLASTIC CONTAINER CAP UNIT WITH INTEGRAL SEALING RING

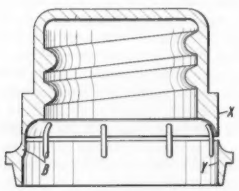
Wilfried Leitz, Bad Krozingen, Germany, assignor to Koninklijke Emballag Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Feb. 24, 1975, Ser. No. 552,592

Claims priority, application Germany, Feb. 25, 1974, 2409015

Int. Cl.² B65D *41/32*

U.S. Cl. 215—252 **5 Claims**



1. An integrally molded plastic closure cap unit for a bottle and like container and having a closure cap with an annular skirt and adapted to be removably inserted over a container neck opening with the annular skirt surrounding the neck of the container, and an annular sealing ring below the annular skirt of the closure cap contoured to be inserted around the container neck and retained thereon to prevent normal removal of the closure cap without severing the closure cap from the sealing ring, the inner diameter of the annular sealing ring being substantially equal to and coaxial with the outer diameter of the closure cap, and the closure cap unit having an annular shear zone intermediate the annular skirt and sealing ring with axially extending severable means interconnecting the annular skirt and annular sealing ring and adapted to be severed to permit the closure cap to be removed from the container.

3,929,247

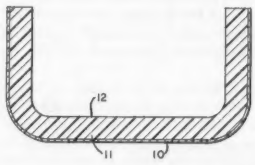
CRYOGENIC TANK

Herbert H. Borup, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 11, 1973, Ser. No. 378,138

Int. Cl.² B65D *25/18*

U.S. Cl. 220—9 LG **11 Claims**



1. An internally insulated tank capable of storing or transporting a large volume of liquid at temperatures down to −260°F comprising an outer support shell, a layer of rigid closed cell polyurethane foam having a density of about 2.5 to 10 pounds/ft³ attached to the inner surfaces of said support shell and a thin impervious metallic layer less than 0.015 inch thick completely bonded to the inner surfaces of said foam layer with the bond therebetween being at least as strong as the foam to restrict the thermal contraction of said foam surface at cryogenic temperatures and thereby minimize crack formation therein, said metallic layer having a substantially lower coefficient of expansion and a substantially higher tensile strength than said foam and further characterized by high ductility at low temperatures.

3,929,248

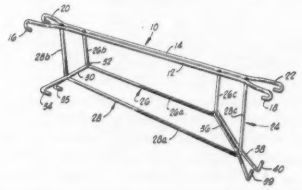
DIVIDER AND PARTITION DEVICE FOR WIRE

Jimmie H. Morrison, 2921 Monitor, Norman, Okla. 73069

Filed Jan. 26, 1973, Ser. No. 326,983

Int. Cl.² B65D *7/20*

U.S. Cl. 220—19 **14 Claims**



1. A partition device for providing a partition in a wire basket, said device comprising:

an elongated, longitudinal top member;

means on opposite ends of said longitudinal top member for detachably engaging opposite sides of a wire basket adjacent the top of said basket;

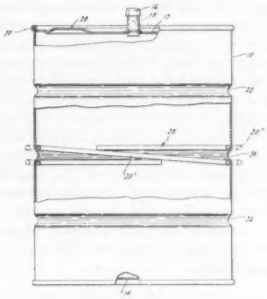
rod means attached along one side of longitudinal top member and projecting therefrom to lie substantially in a plane including the longitudinal top member, said rod means extending from a first point of attachment of the longitudinal top member thereto adjacent one end of the longitudinal top member, and including a wire having a non-linear end section thereon arranged for contacting at least one wire of said basket at a second point spaced downwardly from the other end of said longitudinal member which is opposite said one end thereof, said rod means further including a plurality of wires collectively forming a diagonal brace for transmitting a force between said second and first points, and said wire having said nonlinear end section extending diagonally on said partition device and with respect to said longitudinal top member,

and projecting from said second point toward said first point for transmitting force diagonally with respect to said longitudinal top member.

3,929,249
VACUUM RESERVOIR

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,166
Int. Cl.² B65D 7/42
U.S. Cl. 220—71 18 Claims



1. A vacuum reservoir comprising: a generally cylindrical longitudinally extending sheet metal body member having a plurality of circumferentially extending radially inwardly projecting ridges formed therein, one of said ridges being disposed in the vicinity of the longitudinal center of said body member; end members sealingly closing the ends of said body member to define a fully enclosed reservoir; inlet passage means in one of said end members for communicating fluid into and out of said reservoir; a helical coil spring having a plurality of coils and being disposed within said body member, the entirety of said spring being disposed in the vicinity of said one of said ridges with at least one coil on each side thereof, said spring being in a stressed state to thereby exert a radially outward bias on said body member for substantially the full circumferential extent of said spring, whereby said body member is placed in circumferential tension in the vicinity of said spring, said spring being maintained in position solely by frictional engagement with said body member and mechanical engagement with said one of said ridges.

3,929,250
GASOLINE TANK PLUG

John Abbate; Warren R. Jewett, both of Orange, and William H. Mason, Woodbridge, all of Conn., assignors to John Abbate, Orange, Conn.

Filed Feb. 3, 1975, Ser. No. 546,328
Int. Cl.² B65D 53/00
U.S. Cl. 220—237 6 Claims

1. A device for plugging gasoline tanks and the like, comprising:

a bolt having a flared end, a grippable end and a threaded portion between said ends;

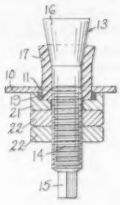
a non-metallic, radially expandable sleeve seal slidably fitted on said bolt below said flared end and having an outside diameter adapting said sleeve seal to be received in a hole of predetermined diameter in said gasoline tank;

a gasket slidably fitted on said sleeve seal, the outside diameter of said gasket being greater than the diameter of said hole;

a washer on said bolt, said washer having a cavity for sealingly receiving said gasket; and

at least one nut on said threaded portion in abutment with said washer on the opposite face thereof from said cavity;

said nut acting on said washer and bolt, when said washer and gasket abut the rim of said hole in said tank, whereby said flared end of said bolt causes said sleeve seal to

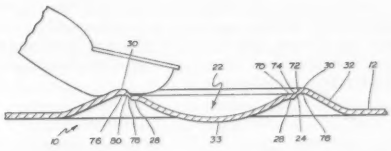


expand outwardly of said hole and thereby to engage and to anchor on the edges of said hole interiorly of said tank, and said gasket sealingly engages the rim and edges of said hole exteriorly of said tank.

3,929,251
CONTAINER WALL WITH RUPTURABLE WEAKENING LINE

Hugh C. Urmston, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 281,541, Aug. 17, 1972. This application May 7, 1973, Ser. No. 357,937
Int. Cl.² B65D 17/00
U.S. Cl. 220—268 24 Claims



1. A peripherally chimed sheet metal container component having a wall with

at least one inwardly displaceable opening panel therein non-concentric with the peripheral chime around the container component and constituting a minor portion of the component, said opening panel having an integral rim therearound peripherally terminating in a fracturable web defining a locus of separation of said opening panel from the adjacent portion of said wall,

an integral deflectable portion adjacent said opening panel and projecting outwardly from the general plane of the wall of said container component, said deflectable portion terminating in a lip on the marginal edge thereof toward said web integrally interconnected with the rim of said opening panel and defining therewith said fracturable web,

the rim of said opening panel including an outwardly exposed surface terminally intersecting the outwardly exposed marginal edge of the lip of said deflectable portion in an outwardly exposed corner,

said deflectable portion having a portion of the undersurface thereof terminally meeting the undersurface of the outer marginal edge of said rim in predetermined spaced relation with said exposed corner to define therebetween the extent of said fracturable web,

said opening panel including means for imparting greater rigidity thereto than that of said deflectable portion disposed adjacent thereto to effect an initiation, in response to digitally applied localized inwardly directed pressure against said deflectable portion at a location spaced from the peripheral chime around the container component, of

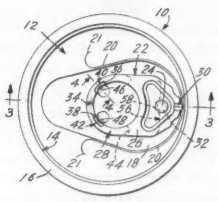
relative displacement of said lip relative to said rim to strain said web and induce fracture thereof to permit inward displacement of a separated opening panel.

3,929,252

CHILD-RESISTANT CLOSURE FOR METAL CONTAINER

Leonard Thomas La Croce, Paramus, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 22, 1974, Ser. No. 499,620
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 12 Claims



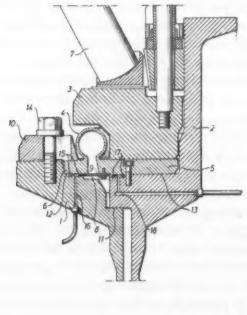
1. In an end closure for a container having a central panel portion, a displaceable portion defined by a score line included in said central panel portion, and an opening tab including a pull ring attached to the displaceable portion at a point proximate the periphery of the central panel portion with the pull ring of the opening tab radially inward from the point of attachment, the improvement which comprises an arcuate channel formed in the central panel portion underlying the pull ring of the opening tab, the channel being configured to coincide with the pull ring and substantially nesting the pull ring therein, and means for releasably engaging the pull ring to maintain and resist movement of the pull ring from said substantially nested position.

3,929,253

METHOD OF ARRANGING A SEAL BETWEEN A PRESSURE VESSEL, PREFERABLY A REACTOR VESSEL, AND ITS LID BY MEANS OF A TORRID RING PROVIDED WITH FLANGES

Erik Börje Johnsson, Trosa, Sweden, assignor to Aktiebolaget Atomenergi, Sweden

Filed Apr. 18, 1973, Ser. No. 352,225
Claims priority, application Sweden, May 26, 1972, 6989/72
Int. Cl. B65d *53/00, 45/00*
U.S. Cl. 220—320 1 Claim



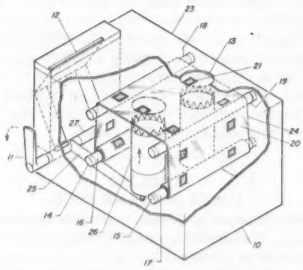
1. A sealing assembly for a pressure vessel including a vessel body having an open end and a lid engaging said vessel body completely about said end to form a preliminary seal for said vessel body, said sealing assembly comprising, in combination, a toroid ring member extending completely about said pressure vessel externally of said preliminary seal, said toroid ring member including integrally formed first and second flanges extending, respectively, radially inwardly and radially outwardly of said ring member, shoulder means formed about said lid and having said first annular flange in abutment therewith, collar means formed about said vessel body and having said second annular flange in abutment therewith, first connecting means releasably affixing said first annular flange against said shoulder means, and second connecting means releasably affixing said second annular flange against said collar means, said first connecting means comprising a support ring extending in abutting relationship about said first annular flange, with said first annular flange being positioned between said support ring and said shoulder means, and support legs extending to apply to said support ring a force clamping said first annular flange between said support ring and said shoulder means, said lid and said vessel body being so configured that the force applied by said support legs to clamp said first annular flange between said support ring and said shoulder means simultaneously operates to press said lid against said vessel body along the engaging portions thereof forming said preliminary seal, and said toroid ring member is formed with an arcuate portion thereof extending between and across a gap between said first and second annular flanges and wherein said assembly includes a spring plate attached to extend across said cap in abutment with both said first and second annular flanges.

3,929,254

STAMP VENDING MACHINE

Rene G. Artze, 61-45 98th St., Rego Park, Queens, N.Y. 11374

Continuation-in-part of Ser. No. 367,234, June 5, 1973, abandoned. This application May 13, 1974, Ser. No. 469,509
Int. Cl.[2] G07F *11/72*
U.S. Cl. 221—30 4 Claims

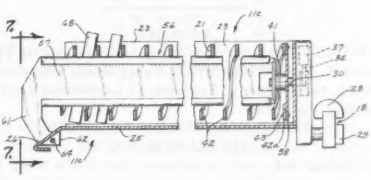


1. A stamp vending machine comprises a housing, a sheet for supporting stamps, a first roller means on which a portion of the sheet is stored, a second roller means cooperating with said first roller means to receive another portion of the sheet, drive means operable for moving the sheet between said roller means passed a viewing point, and removing means operable for removing a part of the sheet, said sheet comprising a plastic and said removing means comprising a heat source operable for producing a circular ring of heat whereby the removing means melts said sheet to cause the removal of a portion of said sheet.

3,929,255
VENDING MACHINE DIVIDED HELIX APPARATUS

Francis A. Wittern, Des Moines, and Arthur N. Wirstlin, Altoona, both of Iowa, assignors to Fawn Engineering Corporation, Des Moines, Iowa

Filed Jan. 31, 1974, Ser. No. 438,435
Int. Cl.² G07F 11/36
U.S. Cl. 221—75 4 Claims



1. In a vending machine having a cabinet and within one portion of which is an item discharge chute for dispensing items to be withdrawn from the machine, a plurality of item discharge units mounted in a side-by-side, horizontally disposed arrangement, each item discharge unit comprising:

tray means having side walls, a rear wall, a bottom and a front end open to the discharge chute, said tray means including a front ledge portion extended forwardly and downwardly toward the chute and beyond the front end of said helical means;

drive means mounted in said machine and having a drive shaft inserted through said rear wall and toward said front end, said drive means customer controlled for predetermined incremental operation;

driven means connected to said drive means and rotatable therewith, said driven means including a disc and sleeve integral therewith, with said sleeve secured to said drive shaft;

divider means mounted within said tray means intermediate said side walls and extended longitudinally of said tray means, one end thereof mounted on said driven means in a non-rotatable manner, and the other end of said divider means secured to said bottom at the front end thereof, said divider means including a rear end extending normal to the axis of said drive shaft, said rear end also having an opening formed therein which is larger than said sleeve, whereby said rear end is fitted over and rests upon said sleeve and said sleeve is inserted through said opening;

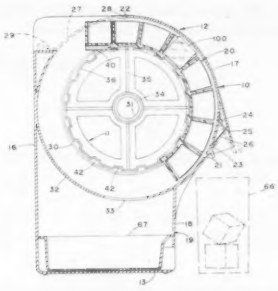
helical means having a plurality of convolutions disposed within and extended the length of said tray means, said helical means secured at the rear end thereof to said driven means so as to be rotatable thereby and supported on said divider means, the arrangement such that articles to be dispensed are placeable completely to each side of said divider means between adjacent convolutions and are discharged alternately from said front end in response to operation of said drive means; and

wherein said front ledge portion of the tray means has a slot formed therein, and said divider means includes an element, the front end of which has a tab inserted through said slot, the bottom of said tab resting upon the bottom of said slot, said tab having a passage formed therein, and an elongated pin extended parallel to and under the said front ledge portion of the tray portion transversely of said tray means and inserted through said passage for locking said element to the front of said tray means.

3,929,256
DISPENSER FOR ICE CUBES AND THE LIKE

Arieh Solomon, Tel Aviv, Israel, assignor to Avraham Deshe, Tel Aviv, Israel

Filed Mar. 13, 1974, Ser. No. 451,004
Claims priority, application Israel, Mar. 13, 1973, 41765
Int. Cl.² G07F 11/00
U.S. Cl. 221—81 11 Claims



1. Dispensing apparatus for ice cubes or other discrete articles comprising:

a circular rotatable wheel;

a longitudinally extending flexible magazine insertable into engagement with the periphery of said rotatable wheel, said magazine being normally flat and having a bottom that fits and conforms to the curved periphery of said wheel when in engagement therewith and having a plurality of spaced compartments arranged longitudinally in parallel rows, such that the compartments in adjacent rows are in relatively staggered disposition to one another, said compartments being adapted to hold discrete articles, wherein adjacent compartments of said magazine are defined by spaced transverse walls interconnected by a longitudinal wall, whereby the discrete articles are ejected from the compartments in response to the flexure of said magazine in conformity with the periphery of said wheel;

a cover having an outlet opening operatively associated with said wheel for retaining the contents of said magazine therein until rotation of said wheel places a single compartment in alignment with said outlet opening in said cover at which time as article in the last mentioned compartment is gravity dispensed through said outpet opening; and

wherein the sides of said magazine and the sides of said cover have cooperating ridges and grooves for retaining the bottom of said magazine engaged with the wheel periphery during rotation of said wheel.

3,929,257
MECHANICAL INTERLOCK DEVICE FOR A VENDING MACHINE

Manohar Mohan, Cincinnati, Ohio, assignor to William F. Shepherd, Inc., Cincinnati, Ohio

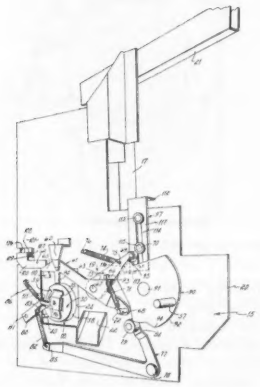
Filed Jan. 30, 1975, Ser. No. 545,401
Int. Cl.² G07F 11/16
U.S. Cl. 221—152 9 Claims

1. A mechanical interlock device for a product dispenser mechanism of a vending machine, said mechanical interlock device being adapted to cooperate with a credit accumulator device of the type that includes a rotatable credit cam having a notch in the periphery thereof, said interlock device comprising

a drive cam adapted to be rotated by said product dispenser mechanism from a home position to a vend position, said

drive cam presenting a cam track on a first portion of its periphery and a lock notch on a second portion of its periphery,

a sensing arm having a sensing finger adapted to ride on the periphery of said credit cam and move into said credit cam's notch when same is presented thereto, said sensing arm being positioned to contact said drive cam's cam track, said sensing arm's finger being moved out of said credit cam's notch upon rotation of said drive cam from home position toward vend position,



a locking arm having a bolt movable into and out of locking relation with said drive cam's locking notch, said sensing arm and locking arm being connected together in a manner that permits said bolt to be retracted from locking engagement with said drive cam upon rotation of said credit cam when said sensing finger moves into said credit cam's notch and permits said bolt to be moved into locking engagement with said drive cam when said drive cam has returned to home position from vend position.

3,929,258

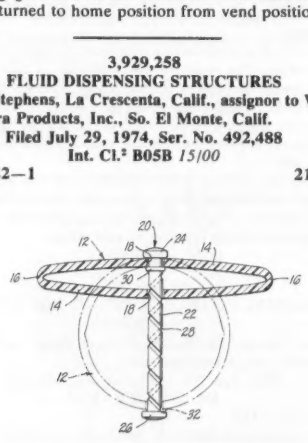
FLUID DISPENSING STRUCTURES

James B. Stephens, La Crescenta, Calif., assignor to Westates Space-Era Products, Inc., So. El Monte, Calif.

Filed July 29, 1974, Ser. No. 492,488

Int. Cl.² B05B *15/00*

U.S. Cl. 222—1 **21 Claims**



1. A fluid dispensing structure which includes:

an elongated, flexible, fluid impervious tube of an organic polymer material which is capable of changing in cross-sectional configuration between a substantially flat configuration and a circular configuration in accordance with changes in internal pressure within said tube, one end of said tube being adapted to be connected to a source of fluid under pressure,

said tube having a plurality of holes located along its length,

an elongated flow control member associated with each of said holes, each of said flow control members having a cross-sectional configuration which renders it capable of moving with respect to the hole with which it is associated at all times of said tube changes in cross-sectional configuration between said substantially flat configuration and said circular configuration, each of said flow control members having a cross-sectional configuration different than its associated hole so as to permit flow to the exterior of said tube when a fluid is supplied to the interior of said tube.

3,929,259

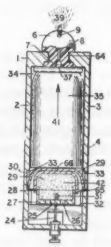
CHEMICAL DISPENSING ANTI-BURGLAR DEVICE

Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605, and Werner F. Esseluhn, 12 Larchwood Road, Wyomissing, Pa. 19610

Filed June 4, 1974, Ser. No. 476,314

Int. Cl.² B67D *5/08*

U.S. Cl. 222—61 **6 Claims**



1. A chemical dispensing anti-burglar device for use with a pressurized container, the device comprising: a housing, means for supporting said pressurized container in said housing; a fluid passageway extending through said housing having an entry section, means for discharging fluid from said pressurized container into said entry section of said passageway, a reciprocal member slideably mounted within said housing and adapted upon movement to discharge fluid from said pressurized container, an enclosed expansion chamber within said housing, an expansive charge within said chamber, means for causing expansion of said charge within said chamber, said reciprocal member having a surface against which the gases resulting from said expansion react to move said reciprocal member within said housing to cause discharge, a spring activated retaining means for locking said reciprocal member in position to cause discharge after said expansion, a sealing means formed around said entry section and said discharging means and arranged to prevent fluid leakage as fluid is discharged from said pressurized container into said passageway.

3,929,260

GLUE DISPENSING ASSEMBLY

Richard J. Ernst, Palatine, Ill., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 312,352, Dec. 5, 1972, abandoned. This application Feb. 13, 1974, Ser. No. 442,287

Int. Cl.² B67B *7/24*

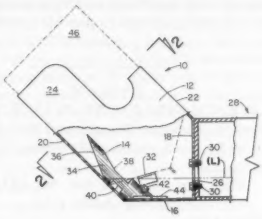
U.S. Cl. 222—88 **6 Claims**

1. Apparatus for dispensing a liquid in a container, comprising:

a housing into which the container is insertable downwardly along a linear path;

a tubular blade member having at least one opening in its wall;

means for connecting the blade member inside the housing with its axis parallel to the direction of the linear path, whereby said blade pierces a hole in the container upon its being inserted a predetermined amount; and



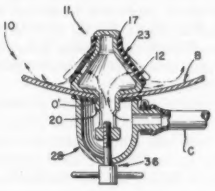
a pair of tabs connected to the inside of the housing at a level above the bottom of the housing for limiting the extent to which said container is insertable into the housing, said hole and at least one of said openings being in communication when further insertion of the container is limited, whereby the liquid in the container maintains a sump of the liquid in the bottom of the housing.

3,929,261

AERATION DEVICE AND METHOD FOR ASSISTING DISCHARGE OF MATERIAL FROM CONTAINERS

Keith F. Solimar, New Brighton, Minn., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Feb. 4, 1974, Ser. No. 439,530
Int. Cl.² B65G *3/12*
U.S. Cl. 222—195 **6 Claims**



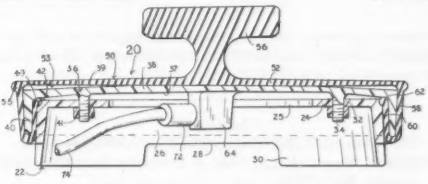
1. An aeration device for assisting discharge of material from containers, comprising a cone shaped support means having a small diameter end and a large diameter end and adapted to be affixed to a wall of a container with the large end thereof adjacent the interior of the container wall and the small diameter end extending into the interior of the container, said support means having an air inlet adjacent the large diameter end thereof adapted to be connected to a source of air exteriorly of the container, and an air outlet interiorly of the container, a flexible, cone shaped flap correspondingly shaped to the support and having a small diameter end fixed on the small diameter end of the support means and extending in close fitting relationship to the support means and closing said air outlet, the large diameter end of the flap disposed adjacent the container wall when the device is in operative position and said large diameter end of the flap being free of attachment to said support means for flexing movement thereof toward and away from the support means to close and open said air outlet, whereby when said device is used, flow of air through said support means and outwardly through said outlet induces flexation of said large diameter end of said flap away from said support means and flow of air outwardly relative to the axis of the support and toward the container wall and into material stored in the container to aerate the material, the flexibility of said flap being such that it is caused to flutter or vibrate by air flowing therepast to agitate material in the container and prevent bridging of the material in the container and to insure substantially complete removal of the material from the container.

3,929,262

SELF-PRESSURIZED PORTABLE CONTAINER FOR LIQUIDS

John S. Viehe, 692 Talamini Road, Somerville, N.J. 08876

Filed Feb. 26, 1975, Ser. No. 553,095
Int. Cl.² B65D *37/00*
U.S. Cl. 222—210 **10 Claims**



1. A self-pressurized portable container for liquid, comprising:

a bottom ring plate having

an upper annular flange defining a central hole, and

a depending circumferential side wall integrally joined to the periphery of said flange;

a pressure plate having

a circular upper wall, and

a depending circumferential other side wall integrally joined to the periphery of said upper wall and nesting on the bottom ring plate;

a circular elastic membrane having

a circular top wall overlaying said pressure plate and defining therewith an an expansible chamber for containing liquid under pressure,

an axially extending depending skirt integral with the periphery of said top wall, surrounding and abutting said other side wall, and

an inwardly turned circumferential wall concentric with and integral with said skirt engaged between the side wall of the bottom ring plate and the other side wall of the pressure plate; means in the pressure plate for filling and emptying said chamber and

attachment means detachably securing the ring plate and pressure plate together to hold the inwardly turned wall of the membrane in sealing pressure engagement while the top wall of the membrane is free to expand under pressure of liquid filling said chamber.

3,929,263

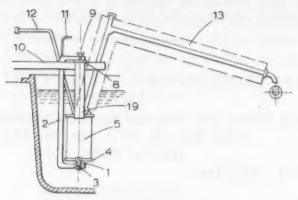
APPARATUS FOR PORTIONING LIQUID METAL

Ivar Dagfinn Heimdal, and Ivar Skreosen, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Oct. 21, 1974, Ser. No. 516,871
Claims priority, application Norway, Oct. 19, 1973, 4065/73
Int. Cl.² B22D *17/30*
U.S. Cl. 222—373 **5 Claims**

1. In an apparatus for portioning liquid metal comprising a portioning container intended to be submerged into a reservoir of molten metal, means for supplying pressure gas to said container and a metal outlet therein to be connected with a mould, such as a die-casting machine, said container being provided with a demountable valve means positioned at a bottom portion thereof to permit liquid metal to flow into said container when gas pressure is relieved, the improvement wherein: said valve means comprises a valve housing having an upper portion which during operations extends through an opening in the bottom portion of said container with sufficient clearance to permit the valve housing to be tilted in relation

to a vertical when being inserted into said opening, said valve housing being provided with an outer, upward narrowing, generally conical flange having a contact area intended to



contact a generally conically shaped seating area at said opening in the bottom portion of said container, said valve housing being pivoted to a lever.

3,929,264

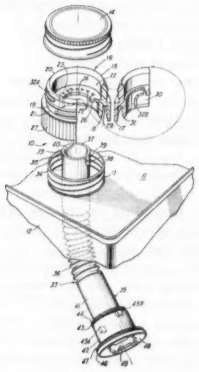
DOUBLE SEALING POURING ASSEMBLY

Walter P. Maynard, Jr., 6650-A Peachtree Industrial Blvd., Atlanta, Ga. 30340

Filed June 28, 1974, Ser. No. 483,987

Int. Cl.² B67D 5/12

U.S. Cl. 222—525 **6 Claims**



1. A double sealing pouring assembly for operable connection to a container having a dispensing neck and which is adapted to contain therein a supply of dispensing material, comprising:

a. a closure means for said dispensing neck;

b. a collar for removable sealing engagement with said neck, said collar including an upper portion for selected sealing engagement with said closure means and a bifurcated section depending therefrom which engages said neck therebetween; and,

c. a spout slidably positioned within said collar for selective positioning at retracted and extended positions, said spout having an outer end portion for dispensing said material therefrom, an inner end portion for engaging said collar at said extended position and a central passage extending therethrough;

said bifurcated section of said collar including an outer wall whose inner surface engages the exterior of said dispensing neck, and an inner wall having a radially extending shelf with an opening therethrough for slidably receiving said spout;

said inner end portion having a section of greater diameter than said central passage and being in communication therewith by means of an intermediate annular ledge, said section terminating in a flared ring portion; and

wherein said assembly is provided with a means for locking said spout within said collar when said spout is in its extended position, said locking means comprising a protrusion and a groove for mating engagement with said protrusion, whereby said annular ledge engages the underside of said shelf and said ring portion engages the bottom of said inner wall to provide a double seal for said spout in its extended position.

3,929,265

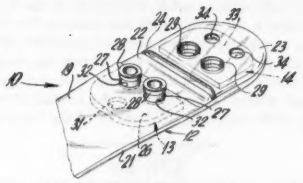
WATCH STRAP WITH PLASTIC CLIP

Bernard Pyne, Sunbury on Thames, and Robert Liddle, Woodley, both of England, assignors to Timex Corporation, Waterbury, Conn.

Filed Jan. 14, 1974, Ser. No. 433,025

Int. Cl.² A44C 5/16

U.S. Cl. 224—4 D **4 Claims**



1. A quick-fastening watch strap adapted to be secured about the spring bar of a watch case comprising a pair of strap elements, each including:

an outer plastic layer having at least one aperture and an inner plastic layer which extends along a substantial portion of the outer layer and is affixed thereto along the edges of said layers, said outer layer having an end terminating a predetermined distance from an end of the inner layer and said inner layer further including at least one aperture therethrough,

a stud plate having a base portion positioned between the outer plastic layer and the inner plastic layer, said plate having at least one stud projecting upwardly therefrom through the aperture in the inner layer,

the stud plate including at least one hollow cylindrical stud having an enlarged lip portion at the end thereof to facilitate locking engagement with a corresponding aperture in the keeper plate in a snap fit, said lip being of no greater length than the thickness of said outer layer so as not to project therefrom,

a keeper plate disposed on the terminating end of said outer layer having at least one aperture extending therethrough in alignment with the aperture in the outer layer to receive and retain the end of said projecting stud within said outer layer aperture without projecting therefrom when the strap end is folded back about a spring bar, said keeper plate including anchoring means, and,

connecting means mounted to the strap element at the other end and adapted to be secured to mating connection means to hold the watch in place about one's wrist.

3,929,266

KEY HOLDING DEVICE

Jung K. Kim, 617 Via Altamira, Montebello, Calif. 90640

Filed Mar. 13, 1974, Ser. No. 450,824

Int. Cl.² A45F 5/02

U.S. Cl. 224—26 R **2 Claims**

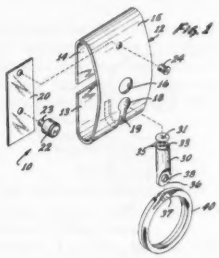
1. A security type holding device for keys comprising:

a holder formed of a sheet of metal having its upper and lower end portions bent back to form a substantially flat

back wall and having its central portion rounded to form an outwardly curved front wall spaced from said back wall so as to form a lateral opening through which a belt being worn by a person can be passed and held flat against the back wall, said outwardly curved front wall having a centrally disposed first opening and a second opening with a slot extending downwardly from said second opening and partly across the lower end portion of the holder, said second opening having a width larger than the width of said slot,

a leaf spring having a button attached to the surface thereof, said leaf spring fixed at its upper end to the underside of the outwardly curved front wall with the button thereof projecting through the first opening on said front wall and with the surface of the leaf spring resiliently urged to bear closely against the underside of the outwardly curved front wall so as to cover the second opening on the upper end of the slot,

a disconnect element having a cylindrical body and having a head formed on the upper end thereof by a recessed neck, said neck having a diameter smaller than the width



of said slot and said head and cylindrical body both having a diameter larger than the width of said slot, said head being of such a size that it can be inserted through the second opening to depress said leaf spring and then moved down such that said element is engaged by its recessed neck in said slot to thereby retain it on said holder, said neck when engaged in said slot having such a fit therein as to prevent said element from moving into the lateral opening of said holder, and

means for securely coupling one or more keys to the lower end of said disconnect element,

whereby the disconnect element has its head securely engaged by its recessed neck on the slot of said holder and can be removed therefrom by manually depressing said button to push the lower portion of the leaf spring inwardly into the spacing provided between the underside of the outwardly curved front wall and said belt to uncover said second opening and thereby enable the head of the disconnect element to be guided by its recessed neck along the slot up into and out of said second opening.

3,929,267

SHEET MATERIAL TRANSPORT

Alan Foster, 5, Lindsay Ave., Hitchin, Hertfordshire, England

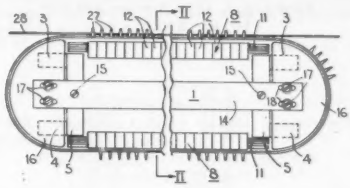
Filed Sept. 21, 1973, Ser. No. 397,471

Claims priority, application United Kingdom, Sept. 16, 1972, 43027/72

Int. Cl. G03b *1/30*

U.S. Cl. 226—74 **8 Claims**

1. Web feeding apparatus including guide means to guide an endless belt around a path having a linear portion; means on the belt arranged to engage the web at least during travel along the linear portion of the path; a plurality of spaced magnetic elements carried on the belt; and means operable to generate a pattern of magnetic fields which moves along at least a portion of the path in a sequence of steps, the magnetic fields being effective to co-operate with the magnetic elements on the belt to cause the magnetic elements and the belt



to move along the path in steps corresponding to the stepping movement of the pattern of magnetic fields.

3,929,268

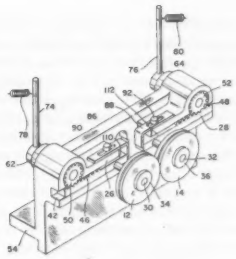
PRESSURE ROLLERS FOR CHENILLE MACHINES

Alexander Gross, 2590 W. Maple Ave., Feasterville, Pa. 19047

Filed Jan. 8, 1974, Ser. No. 431,746

Int. Cl. B65h *17/22*

U.S. Cl. 226—176 **10 Claims**



1. In a pressure roller system containing a left roller and a right roller, the combination of

A left and right block means to each respectively carry one said roller,

1 each roller having rotative motion relative to its associated block means;

B left track means to slidingly receive the left block means,

1 said left block means having longitudinal movement within the left track means,

2 said left track means including means to prevent transverse and vertical movement of the left block means,

3 said left track means including left stop means to limit the inward, longitudinal movement of the associated block means;

C right track means to slidingly receive the right block means,

1 said right block means having longitudinal movement within the right track means,

2 said right track means including means to prevent transverse and vertical movement of the right block means;

3 said right track means being provided with right stop means to limit the inward, longitudinal movement of the associated block means;

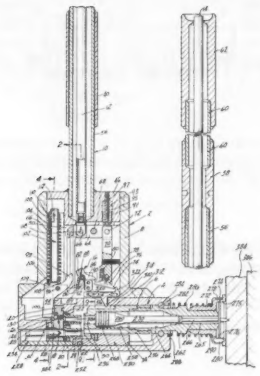
D left and right spring biased means to continuously respectively urge the left and right block means toward each other, whereby the pressure rollers are urged into tangential contact; and

E the left and right stop means having longitudinal adjustment means to vary the inward limit of travel of the left and right block means.

3,929,269
POWDER-ACTUATED TOOL

Elmer R. Hodil, Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 5, 1974, Ser. No. 494,663
Int. Cl.² B25C 1/14
U.S. Cl. 227—10 21 Claims

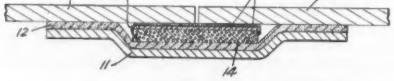


1. A powder-actuated tool comprising a housing, means in said housing for providing a path for a cartridge belt having a plurality of cartridge holding sections, cartridge holding means moveable in said housing and including at least one cartridge holding portion for receiving a cartridge from the cartridge belt, a barrel assembly having an opening therein for receiving at least a portion of said cartridge holding portion, means for moving said cartridge holding means from a first position whereat the cartridge holding portion receives a cartridge from said cartridge receiving belt to a second position when said cartridge holding portion is in alignment with said opening in said barrel assembly and to a third position whereat the cartridge holding portion is in alignment with an empty cartridge holding section of the belt, and means for moving said belt from a position wherein a cartridge holding section having a cartridge therein is in alignment with the cartridge holding portion of said cartridge holding means when the cartridge holding means is in said first position to a position wherein an empty cartridge holding section is in alignment with the cartridge holding portion of the cartridge holding means when said cartridge holding means is in its third position.

3,929,270
FILM-SURFACE WELDING BACKUP TAPE

Roger H. Keith, Ramsey, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 17, 1974, Ser. No. 489,143
Int. Cl.² B23K 5/22
U.S. Cl. 228—50 3 Claims



1. In a welding backup tape of the type in which an elongated heat-resistant flexible tape backing of glass cloth, metal foil or the like is coated with a pressure-sensitive adhesive and provided with, medially adhered along the length thereof, a strip of flexible refractory material comprising refractory particles held together by a flexible binder,

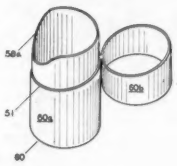
the improvement which comprises, disposed on the surface of said refractory strip opposite said backing, a thin tacky layer of film-forming adhesive which is curable when heated to about 150°C. or more for extended periods, and a monolayer of inorganic particles protectively covering the exposed surface of the tacky adhesive layer to permit easy rolling and unrolling of the tape,

whereby when said tape is applied over one side of a joint to be welded and preheated to temperatures above about 150°C. the heat hardenable film will retain said refractory particles in position, and said inorganic particles will form a smooth glaze during welding, insuring a smooth, sound weld.

3,929,271
CARTON AND BLANK THEREFOR

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sept. 30, 1974, Ser. No. 510,653
Int. Cl.² B65D 3/22, 3/04
U.S. Cl. 229—4.5 6 Claims



1. A unitary carton blank for forming a generally cylindrical carton having a reclosable cover portion adapted to telescope over a receptacle portion, said blank comprising:

a generally rectangular inner and outer wall panels each having an upper, lower and outer edge, said panels having a common inner edge along which they are hingedly connected, said outer wall panel having an integral glue panel portion at its outer edge, the length of said outer wall panel including said glue panel portion thereof being longer than said inner wall panel to permit said outer wall panel to be completely wrapped around said inner wall panel overlapping said inner edge and to permit at least a part of said glue panel portion thereof to be adhered to the outer wall panel beyond said common inner edge,

b a line of weakness formed in said outer wall panel dividing said outer wall panel into an upper section providing a skirt for said cover portion and a lower section providing an outer wall for said receptacle portion,

c at least two generally circular top panels hingedly connected along the upper edge of said outer wall panel,

d a top flap hingedly connected along the upper edge of said outer wall panel between said circular top panels,

e at least two generally circular bottom panels hingedly connected along the lower edge of said outer wall panel, and

f a bottom flap hingedly connected along the lower edge of said outer wall panel between said circular bottom panels.

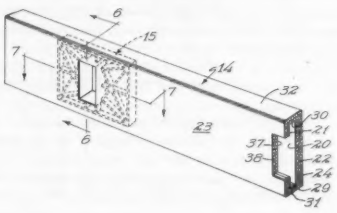
3,929,272
REINFORCED CORRUGATED MEMBER

Renile E. Bowles, Janesville, Wis., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Mar. 14, 1975, Ser. No. 558,342
Int. Cl.² B65D 85/54, 19/40
U.S. Cl. 229—23 C 8 Claims

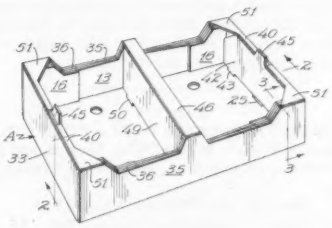
1. An improved skid for use in a shipping container or the like, said skid comprising:

a pair of longitudinal members each formed from a single blank of corrugated paperboard or the like and folded into a tube having a hollow rectangular cross section;
each of said longitudinal members being folded around into substantially rectangular tubular relation and having positioned therein a rigid reinforcing insert;
said reinforcing insert being adapted to fit snugly within the hollow interior of said folded longitudinal member;



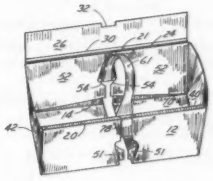
said reinforcing insert having a rectangular aperture formed therein, said aperture defined by a flange extending outwardly through at least one side of said longitudinal member and adapted to receive one end of a wooden cross member interconnecting said pair of longitudinal members.

3,929,273
TRAY FOR STRAWBERRIES AND THE LIKE
Elmer G. Swanson, Salinas, Calif., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Sept. 12, 1974, Ser. No. 505,228
Int. Cl.² B65D *5/22; 229/23 BT, 34 R, 34 HW, 32*
U.S. Cl. 229—34 R **2 Claims**



1. A tray-like shipping container formed from a pair of separate blanks of corrugated paperboard, said container including:
a first tray including a rectangular bottom wall, side and end walls hingedly connected to the sides and ends of said bottom panel,
corner flaps connected to the sides of said end walls and adhesively secured in face contact with the inner surfaces of said side walls,
a second tray including a top flange at each end thereof, side and end panels hingedly connected to said top flanges and extending downwardly therefrom,
corner panels hingedly connected to opposite ends of said end panels and adhesively secured to the inner surfaces of said second tray side panels,
said first and second trays being telescoped together with the side walls of said first tray engaging the inner surfaces of said corner panels of said second tray,
end wall liner panels hingedly connected to said flanges and extending downwardly therefrom in spaced relation to said end panels and engaging said bottom wall,
tongues projecting downwardly from said liner panels and engaging in apertures in said bottom wall to form a hollow end wall, and
said structure resulting in side wall portions underlying said flanges which are of four thicknesses of paperboard, and three thickness hollow end walls.

3,929,274
FRUIT BASKET
Allardus A. Akkerman, Calgary, Canada, assignor to Domtar Limited, Montreal, Canada
Filed Sept. 20, 1974, Ser. No. 507,754
Int. Cl.² B65D *25/22*
U.S. Cl. 229—52 B **8 Claims**



1. A basket comprising a bottom wall, a pair of side walls integrally connected one to each side of said bottom wall, a handle integrally foldably connected at each of its opposite ends to respective of said side walls, said handle being formed in said bottom and said side walls by a pair of lines of severence extending across said bottom wall and part way up each of said side walls, end walls foldably integrally connected to opposite ends of said bottom walls, and flaps integrally foldably connected one at each side edge of said end walls and foldable into face to face relationship with said side walls on respective sides of said basket, a pair of side flaps, means connecting one of said side flaps to each of said side walls along the edges thereof remote from their respective foldable connections to said bottom wall, each of said side flaps folded inwardly and overlying a pair of said end flaps positioned in face to face relationship with the side wall to which said side flap is connected thereby trapping a pair of said end flaps between each of said side flaps and its respective side wall, said side flaps having free edges at least a portion of which is positioned immediately above the said foldable connection between the end of said handle and the side wall to which said side flap is connected.

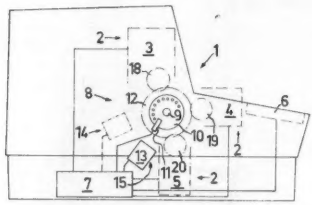
3,929,275
BAGS WITH FILM LINERS AND METHOD OF MAKING
Robert W. Bolling, Savannah, Ga., and Jerry H. Reeves, Bluffton, S.C., assignors to Union Camp Corporation, Wayne, N.J.
Division of Ser. No. 269,755, July 7, 1972, abandoned. This application June 28, 1974, Ser. No. 484,110. The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.² B31B *39/00*
U.S. Cl. 229—55 **5 Claims**

3. The film lined paper bag made by the method of claim 1.

3,929,276
DEVICE FOR SETTING TYPE CARRYING MEANS IN A PRINTING DEVICE HAVING AT LEAST ONE PRINTING POSITION, ESPECIALLY FOR CASH REGISTERS

Göran Ingemar Lundström, Johanneshov; Friedrich Hartmann, Saltsjobaden, and Willem Huijsers, Farsta, all of Sweden, assignors to Hugin Kassaregister AB, Stockholm, Sweden

Filed Apr. 16, 1974, Ser. No. 461,354
Claims priority, application Sweden, Apr. 17, 1973, 7305458
Int. Cl.² G06C 29/00, 11/04
U.S. Cl. 235—61 PK 6 Claims

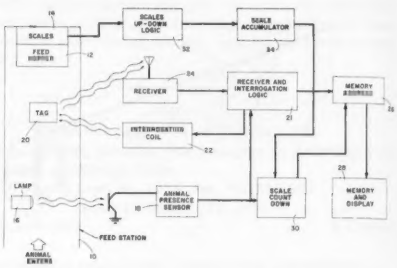


1. A device for setting type-carrying means in a printing device having a printing position, especially for cash registers, said device comprising a pulse generating means which emits pulses to an electronic counting unit and also comprising an electromagnet for each of the character locations, said electromagnet being arranged to change its magnetic state when the counting unit has received a predetermined number of pulses from the pulse generating means, said number of pulses corresponding to the symbol which is to be set, and in which device a driven setting unit is provided for each electromagnet, said setting unit being arranged to cooperate with a type-carrying means of each respective character location, the setting units being arranged side by side on a common driven axle and have lesser dimension in the axial direction of the axle than in the radial direction of the same, there being provided one single setting unit for each character location, said one setting unit being arranged to, when its accompanying electromagnet changes state as a result of the counting unit having received a predetermined number of pulses, disengage a central means in the setting unit from the driven axle, said central means cooperating with the type-carrying means of the printing location, the central means at each setting unit comprising a central wheel which is rotatable on the driven axle and which is provided with teeth along its periphery, said central wheel supporting a retaining mechanism which is arranged for locking and disengaging the central wheel in relation to the drive axle, said retaining mechanism cooperating with a driver which is mounted on the drive axle, said retaining mechanism including a retaining ring which is mounted on one side of the central means, said retaining ring being rotatable to a limited extent in relation to the central wheel and also being concentric to said central means, said retaining ring on its outer periphery being provided with a number of engagement means for cooperation with the electromagnet, the inner periphery of said retaining ring being provided with a locking boss for cooperation with an outer pawl which is pivotable on the central wheel, an inner pawl being arranged to be in or out of engagement with the driver depending on the position of the outer pawl in relation to the locking boss of the retaining ring, the inner pawl and the outer pawl each being comprised of an arm which is journalled at one end, said arms being arranged to be turned outwards away from the driven axle and disengage the central means as the rotation of the retaining ring is stopped by means of the electromagnet, the retaining ring being thereby turned to a disengagement position in relation to the central means.

3,929,277
ANIMAL FOOD MONITOR

John A. Byrne, and Charles K. Rhea, Jr., both of Cookeville, Tenn., assignors to Universal Identification Systems, Inc., Cookeville, Tenn.

Filed Dec. 12, 1974, Ser. No. 532,204
Int. Cl.² G06K 7/08; A01K 5/02
U.S. Cl. 235—61.6 R 6 Claims

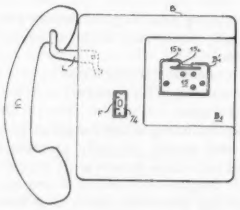


1. Apparatus for determining the amount of food consumed in a given time by each of a plurality of animals comprising a feed station, a scale located at the feed station, a feed hopper mounted on the scale, means for sensing the presence of an animal at the feed station, means responsive to the actuation of the presence-sensing means to determine the identity of the given animal, consumption measuring means connected to the scale for determining the amount of food consumed from the feed hopper by the given animal subsequent to the actuation of the presence-sensing means, memory means for storing the cumulative totals of food consumption of all of the animals individually, means responsive to the actuation of said identity determining means for connecting the consumption measuring means into that portion of the memory means corresponding to the given animal, and means responsive to the departure of the given animal from the feed station for returning the consumption measuring means to zero in preparation for the entry of the next animal into the feed station.

3,929,278
PREPAYMENT APPARATUS WITH A CODED TICKET

Loic Balavoine, Valence; Robert Cadot, Toulaud, and Jacques Sapy, Valence, all of France, assignors to Crouzet, Paris, France

Filed Feb. 19, 1974, Ser. No. 443,779
Claims priority, application France, Feb. 23, 1973, 73.06637
Int. Cl.² G06K 7/08; G07F 1/06
U.S. Cl. 235—61.8 R 3 Claims



1. Prepayment apparatus with coded ticket including a movable reading and erasing head for the data written on the ticket, first mechanical means for introducing and setting in place the ticket, second mechanical means for effecting the successive steps of the working cycle, and means for exploit-

ing the coded data on the ticket to control said second mechanical means, wherein the first mechanical means includes a ticket-carrying slider slidable on a slide fitted with a movable member including two coaxial pinions meshing respectively with a rack fixed to the frame of the apparatus and with a rack fixed to said ticket-carrying slider, relative movement between these two elements producing the setting of helical springs and the movement of a weight, the slide being also fitted with a retaining pawl, the second mechanical means includes a lever associated with a crank which transmits an alternative motion to the magnetic head, a locking pawl for said lever, a setting lever coupled with said lever through a crank and including at one end thereof a longitudinal aperture, said both levers being permanently urged towards each other by a spring whose attachment points determine unequal lever-arms, governor means for moving the magnetic head, a rack slider carrying an electrical feeler whose motion is controlled by a step-by-step escapement which is itself controlled by electrical impulses through an electromagnet and the means for exploiting the coded data includes a counter-subtracter with reset controlled by a contact, a diode matrix decoding a plurality of N discrete positions of the counter and a switch a branch of which scans a series of N contacts connected to the conductors representing the N discrete positions of the counter.

3,929,279

FLIGHT PATH CALCULATOR

Hugh P. K. Dibley, 18 Queens Gate Mews, London, SW7 5QJ, England

Filed May 14, 1974, Ser. No. 469,817

Claims priority, application United Kingdom, May 15, 1973, 23071/73

Int. Cl.² G06C *3/00*

U.S. Cl. 235—88 N **2 Claims**

1. A flight path calculator calibrated to display the descent path for a selected type of aircraft, comprising:

a first member having a distance scale increasing linearly in a predetermined direction and calibrated in units of distance;

a second member having an altitude scale increasing in said predetermined direction and calibrated in units of altitude, said altitude scale consisting of three portions: (a) a first portion having a range from zero to a predetermined deceleration altitude and calibrated such that equal lengths of said first portion and said distance scale correspond to units of descent and the distance flown by said aircraft during said descent, respectively, at the indicated air speed for flight of said aircraft below said deceleration altitude; (b) a second portion in which the altitude indicia is maintained at said deceleration altitude and having a length relative to said distance scale corresponding to the distance said aircraft would travel while decelerating from the indicated air speed for flight of said aircraft above said deceleration altitude to said indicated air speed below said deceleration altitude, one end of said second portion being coincident with the said deceleration altitude indicium of said first portion; and (c) a third portion having a range from said deceleration altitude to a selected maximum altitude and calibrated such that equal lengths of said third portion and said distance scales correspond to units of descent and the distance flown during that descent, respectively, at said speed above said deceleration altitude, said deceleration altitude indicium of said third portion being coincident with the other end of said second portion; and

means for constraining said first and second members to move relative to each other while maintaining said distance and altitude scales juxtaposed so that the markings on one can be read off against the markings on the other.

3,929,280

TERMINAL AIR OUTLET DEVICE

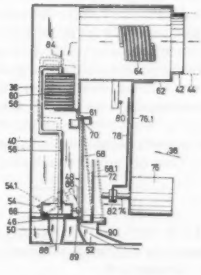
Leslie John Kloot, Cape Town, South Africa, assignor to Cape Air Conditioning (Proprietary) Ltd., Milnerton, South Africa

Filed June 7, 1974, Ser. No. 477,331

Claims priority, application South Africa, July 11, 1973, 73/4666

Int. Cl.² F24F *11/02, 13/08*

U.S. Cl. 236—1 B **16 Claims**



1. A terminal air outlet device for use at a discharge from a building air distribution system, including

a. a housing;

b. a chamber defined within the housing;

c. an inlet leading into the chamber and being adapted for connection to a building air distribution system;

d. a first air outlet from the chamber through which air is adapted to be discharged in a first direction,

e. a first fixed air guide means at the air outlet for guiding air in the first direction;

f. a second air outlet from the chamber through which air is adapted to be discharged in a second direction, which direction is substantially at right angles to the first direction;

g. a second fixed air guide means at the second air outlet for guiding air in the second direction; and

h. control means for regulating air discharge through the first and second outlets.

3,929,281
FLUID MIXING VALVES

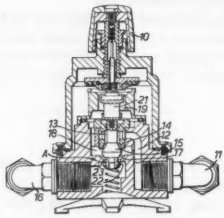
Alan Francis Woodward, Hockley, England, assignor to Barking Brassware Company Limited, Barking, England

Filed Nov. 5, 1973, Ser. No. 412,966

Claims priority, application United Kingdom, Nov. 10, 1972, 52051/72

Int. Cl. B05d *23/13*

U.S. Cl. 236—12 R **4 Claims**



1. A mixing valve for mixing first and second fluids, the valve comprising in combination
1. an inlet for the first fluid,
2. an inlet for the second fluid,
3. an outlet for the mixed fluids,
4. a main valve member located between said inlets and movable to vary fluid flow through each said inlet in inverse relation to fluid flow through the other inlet,
5. control means including a thermostatic device connected to said main valve for controlling the position thereof to vary said fluid flow,
6. an auxiliary valve member carried by said main valve member for movement therewith,
7. said second inlet being located between said main valve member and said auxiliary valve member whereby fluid flow through said second inlet is controlled by said auxiliary valve member only when fluid flow through the first inlet falls below a predetermined rate after which fluid flow through the second inlet is controlled by said auxiliary valve in accordance with fluid flow through said first inlet, and
8. further valve means operable by said control means for controlling the flow of fluid through said outlet.

3,929,282
THERMOSTAT FOR CONTROLLING A LIQUID MIXER

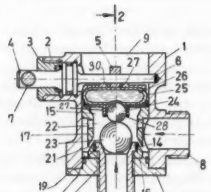
Franz Doll, Montreux, Switzerland, assignor to Bernd Grohe, Villa Les Cretes, Switzerland

Filed Jan. 28, 1974, Ser. No. 436,895

Claims priority, application Switzerland, Feb. 1, 1973, 1328/73; Apr. 18, 1973, 5563/73

Int. Cl.² G05D *23/00*

U.S. Cl. 236—12 R **13 Claims**



1. A combination of a thermostat and a mixer for liquids of different temperatures, comprising:

said mixer comprising:

a housing, a mixing chamber in said housing, a cold liquid inlet to said mixing chamber, a separate hot liquid inlet to said mixing chamber, a mixed liquid outlet from said mixing chamber;

a shiftable temperature regulating element in said mixing chamber, which said element is shiftable to various positions which block at least one said liquid inlet;

a seat at said hot liquid inlet; said temperature regulating element being shiftable toward and away from said seat, and said seat and said regulating element being cooperatively so shaped that when said regulating element is on said seat, flow through said one liquid inlet is blocked;

said temperature regulating element comprising a floatable ball, which floats in the presence of a liquid in said mixing chamber;

said cold liquid inlet communicates into said mixing chamber through inlet ports oriented to direct inflow at said ball and in a direction which raises said ball off said seat;

said thermostat comprising an enclosed thermostat chamber that is in communication with said mixing chamber and that is surrounded and defined by an elastic, flexible diaphragm-like jacket; said thermostat chamber being filled with a heat-sensitive, heat-expansive, hydropneumatically acting material; said jacket being in engagement with said temperature regulating element, thereby to shift the position of that said element as the temperature varies and as the volume of the material in said thermostat chamber varies.

3,929,283
THERMOSTATIC MIXING APPARATUS AND A RELATED METHOD FOR REGULATING TEMPERATURE

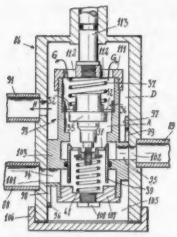
Claude Delpla, Reims, France, assignor to Societe Generale de Fonderie, Paris, France

Filed May 23, 1974, Ser. No. 472,849

Claims priority, application France, Nov. 13, 1973, 73.40290

Int. Cl.² G05D *11/16*

U.S. Cl. 236—12 R **9 Claims**



1. A thermostatic mixing apparatus primarily intended for use in sanitary installations, comprising a body having two inlets which open respectively into a cold-water admission chamber and a hot-water admission chamber and containing a mixing chamber which opens into an outlet for the discharge of blended water, means comprising a thermostatic cell for regulating the temperature of the mixture and means for controlling the outflow rate, wherein said apparatus comprises a delivery chamber in communication with the mixing chamber and adjustable means for introducing either of the feed water streams directly into said delivery chamber, said body being cylindrical, and a bush mounted in coaxial relation to the body so as to define the mixing chamber and provided with ports for the admission of feed water into the mixing chamber, wherein the bush is adapted to carry a cover pierced by a hole and forming a partition-wall between the mixing chamber and the chamber for the delivery of blended water, and wherein longitudinal gaps for the admission of hot water and cold

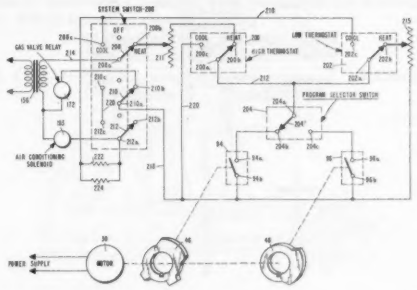
water directly from the inlets into the delivery chamber are formed in the bush.

3,929,284

PROGRAMMABLE TIMER MECHANISM

Mike Prewarski, 3432 Lansdowne Drive, and Edward Mills, 3415 Thistletow Drive, both of, Lexington, Ky. 40502

Filed July 25, 1974, Ser. No. 491,635
Int. Cl.² G05F *23/19*
U.S. Cl. 236—46 **6 Claims**



1. A dual temperature control system for controlling the temperature of a zone comprising:

a. first and second zone thermostats;

b. a first programmable means for determining the time said first and second thermostats are effective to control temperature of said zone;

c. a second programmable means for determining the time said first and second thermostats are effective to control temperature;

d. means for automatically selecting which of said first and second programmable means determines when said thermostats are effective to control temperature; and

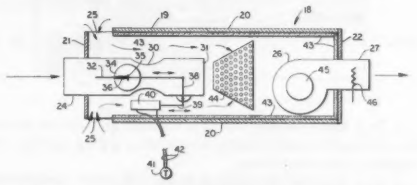
e. means for manually selecting one of said first and second programmable means to determine when said thermostats are effective to control temperature.

3,929,285

AIR CONDITIONING SYSTEM

Carl Francis Daugherty, Jr., P.O. Box 28617, Atlanta, Ga. 30328

Filed Mar. 25, 1974, Ser. No. 454,596
Int. Cl.² F24F *11/04*
U.S. Cl. 236—13 **7 Claims**



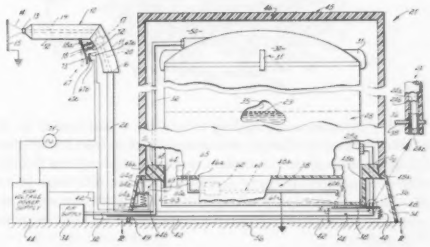
1. An air induction box comprising a housing with side walls and opposed end walls, a primary air conduit entering said housing through a first end wall and extending into said housing with its end opening extending toward the second end wall, at least one unrestricted secondary air inlet opening in said housing adjacent the entrance of said primary air conduit into said housing, a substantially constant speed centrifugal blower in said housing including an exhaust conduit extending through the second end wall arranged to continuously exhaust mixed air from said housing at a substantially constant rate, a sound baffle in said housing, valve means in the portion of said primary air conduit extending into said housing for selectively decreasing or increasing the flow of primary air through said primary air conduit, said valve means comprising a venturi in said primary air conduit, a valve support rod in said primary air conduit upstream from said venturi movable along its length toward and away from said venturi, a valve ball mounted on and movable with said valve support rod toward and away from said venturi and spring means connected between said valve ball and said valve support rod and arranged to permit relative movement between said valve ball and said valve support rod and to bias said valve ball away from said venturi, whereby the valve ball moves along the length of the valve support rod in response to differential air pressure across the valve ball and regulates the flow of primary air into the housing.

3,929,286

APPARATUS AND METHOD FOR ELECTROSTATICALLY SPRAYING HIGHLY ELECTRICALLY CONDUCTIVE WATER-BASED COATING MATERIAL

Donald R. Hastings, Elyria, and Jeffrey S. Noss, Bay Village, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jan. 29, 1975, Ser. No. 545,152
Int. Cl.² B05B *5/08*
U.S. Cl. 239—3 **40 Claims**



1. A system for electrostatically spraying highly electrically conductive water-based paint with improved safety, comprising:

a spray device for directing electrostatically charged water-based coating material toward an object to be coated which is maintained at a potential different from that of the charged coating material,

a container for highly electrically conductive waterbased coating material,

a fluid conduit interconnecting said container and said spray device for transporting water-based coating material from said container to said spray device,

a source of electrostatic charging potential for charging water-based coating material in said container, conduit and spray device,

an electrically insulative enclosure surrounding said container, said enclosure having an opening therein provided with a removable cover to selectively expose and facilitate access to said coating container, and

means to electrically ground said charged coating material concomitantly with removal of said enclosure cover, thereby dissipating electrical energy stored in capacitive form in said system and in turn minimize electrical shock hazards upon removal of said cover to expose said coating container for access thereto.

15. A method of electrostatic spraying in which safety hazards are minimized when replenishing a container with highly electrically conductive water-based coating material following electrostatic spraying of charged coating material from a spray device supplied from said container via a hose, said method comprising the steps of:

enclosing the container with an insulative enclosure while spraying charged water-based coating material supplied to the spray device from said container via an electrically insulative hose,

removing a cover from an opening in the enclosure to facilitate access to said container subsequent to termination of spraying, and

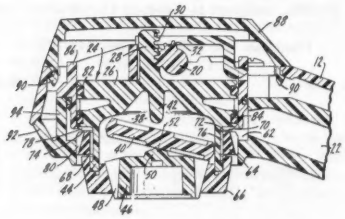
electrically grounding the conductive coating material concomitantly with removal of the cover.

3,929,287

PORTABLE SHOWER HEAD

John D. Givler, Avon Lake; Walter F. Schlotman, Bay Village, and David L. Sipos, Elyria, all of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.

Filed Mar. 14, 1975, Ser. No. 558,233
Int. Cl.² B05B *3/16, 1/30*
U.S. Cl. 239—102 **15 Claims**



1. A shower head including a housing, a water inlet in said housing, water discharge means mounted in said housing and including a diverter movable in said housing between first and second positions, a spray forming member attached to said diverter and passage means in said housing connecting said inlet and spray forming member when said diverter is in said first position,

a chamber in said diverter and passage means in said diverter connecting said inlet and chamber when said diverter is in said second position, a spray head attached to said diverter and defining an outlet for said chamber, and an oscillating member positioned in said chamber and pivotally mounted on said spray head for providing a pulsating discharge for said outlet.

3,929,288

WATER LINE

Giacomo Brusadin, and Giordano Prosdocimo, both of Pordenone, Italy, assignors to Uniflex S.p.A., Roveredo in Piano (Pordenone), Italy

Filed July 22, 1974, Ser. No. 490,705
Int. Cl.² B05B *15/06*
U.S. Cl. 239—201 **5 Claims**

1. A device for connecting distribution lines and for providing branch points of a water distribution system, said device comprising:

a box body having an open top and at least two lateral diametrically opposed openings;

a cover for selectively closing said open top;

a duct body positioned within said box body, said duct body having:

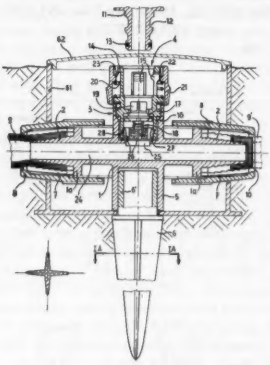
at least two lateral projections, one each extending toward one of said lateral openings of said box body;

a centrally located, vertically upwardly extending projection extending toward said open top of said box body;

duct means internally of said duct body forming interconnected passages through each of said lateral projections and said vertically upwardly extending projection; and

a lower downwardly extending projection integral with said duct body;

nozzle means in said vertically upwardly extending projection for selective coupling thereto of a water utilization device, said nozzle means having therein an automatic valve; and



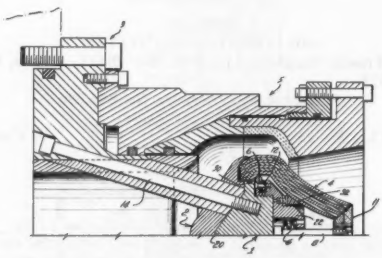
supporting means positioned in said downwardly extending projection of said duct body and extending through the bottom of said box body for fixing said box body to the ground.

3,929,289

PLUG FOR PLUG NOZZLES

Samuel Kardon, Raleigh, N.C., and Carlton J. Curry, Potomac Park, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1968, Ser. No. 788,989
Int. Cl.² B63H *11/00*
U.S. Cl. 239—265.11 **1 Claim**



1. In a rocket motor having a variable area nozzle formed by a moveable cowl portion surrounding a plug member, the improvement comprising:

a plug member comprising inner and outer components, said inner components comprising a forward core, an aft core, and a retainer disk, first resilient means for fastening said forward core to said aft core and second resilient means for fastening said aft core to said retainer disk, said resilient means enabling expansion of said plug components in the presence of heat,

said outer component comprising a forward shell, an aft shell, and an insulator disk, said forward shell and said insulator disk being comprised of asbestos-phenolic material, said aft shell being comprised of plural laminations of bulk preoriented pyrolytic graphite, said laminations of

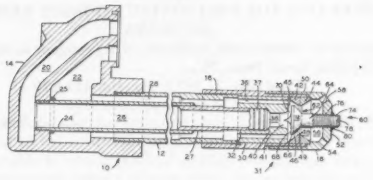
pyrolytic graphite being oriented to conduct heat of combustion to said forward shell and to said insulator disk and to insulate said inner components from heat to minimize dimensional changes in said inner components resulting from the heat of combustion and to thereby protect said plug from structural failure, said inner components being adapted to support said outer components to thereby provide dimensional stability to said plug member.

3,929,290

FUEL ATOMIZER

James F. Tallarovic, Cincinnati, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,682
Int. Cl.² B05B *1/30*
U.S. Cl. 239—417.3 **7 Claims**



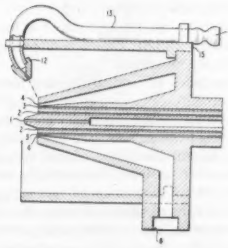
1. A liquid fuel burner having tube means defining a central passageway, barrel means concentrically disposed about said tube means to form therebetween an annular passageway, means supplying a fluid to be atomized to said central passageway and an atomizing fluid to said annular passageway, the improvement comprising an atomizer connected to the barrel means, said atomizer including a cylindrical member having a first and second passageway means communicating respectively with said central and annular passageways, a perforated end cap for discharging the atomized fluid from said burner, and a deflector having plate means cooperating with an end face of the cylindrical member to form therebetween an annular outlet passageway from said first passageway means the plate means including an arcuate projection facing said first passageway means, and, the deflector being mounted on said cap.

3,929,291

SPRAY MIXING NOZZLE

Gerhard Ladisch, Konstanz, Germany, assignor to Otto Pfrengle, Wiesbaden, Germany

Filed May 10, 1974, Ser. No. 468,910
Claims priority, application Germany, May 24, 1973, 2326440; May 20, 1974, 2419148
Int. Cl.² B05B *7/00*
U.S. Cl. 239—425 **7 Claims**



1. A spray mixing nozzle comprising:

a nozzle body having a nozzle outlet, said nozzle body including a central channel for directing pressurized gas to the nozzle outlet, at least two annular channels surrounding the central channel for separately directing liquid to the nozzle outlet, an outer channel surrounding the at least two annular channels for directing pressurized gas to the nozzle outlet, said pressurized gas from the central channel and the outer annular channel forcefully mixing liquids flowing through the at least two annular channels into a fine spray; and

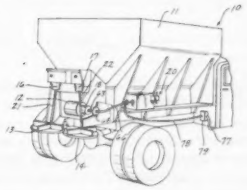
a water spray nozzle mounted to the body of the spray mixing nozzle, said water spray nozzle being mounted to direct a stream of water against the nozzle body in the area of the nozzle outlet.

3,929,292

APPARATUS FOR SYNCHRONIZING THE ROTATIONAL SPEEDS OF A PAIR OF INDEPENDENTLY DRIVEN REVERSELY ROTATABLE SHAFTS

Lyle C. Phillips, Cedar Rapids, Iowa, assignor to Henderson Manufacturing Co., Cedar Rapids, Iowa

Filed Dec. 9, 1974, Ser. No. 530,493
Int. Cl.² A01C *15/00*
U.S. Cl. 239—685 **4 Claims**



1. In combination with a bulk material spreading vehicle having a material unloading conveyor, a vehicle engine driven oil pump unit in operative association with a hydraulic motor for driving said conveyor, and a speedometer having a flexible shaft, apparatus for synchronizing the rotational speed of the hydraulic motor to a predetermined ratio of the ground speed of the vehicle comprising:

a. a housing mountable on said vehicle,
b. a vehicle ground speed monitor shaft,
c. a conveyor speed monitor shaft,
d. an idler shaft reversely rotatable relative to said ground speed monitor shaft,
e. means rotatably supporting said ground speed monitor shaft and idler shaft within said housing and in axially spaced relation,
f. means rotatably supporting said conveyor speed monitor shaft within said housing in a parallel relation with said idler shaft,
g. first means coupling said flexible shaft in a driving connection with said ground speed monitor shaft,
h. second means coupling said hydraulic motor in a driving connection with said conveyor speed monitor shaft,
i. a sensing unit located between the adjacent ends of said idler shaft and ground speed monitor shaft including a first rotatable means for sensing the difference in the rotational speeds of said idler shaft and ground speed monitor shaft and a second rotatable means rotated in response to said rotational difference,
j. coacting means on said idler shaft and conveyor speed monitor shaft for selectively connecting said two shafts for rotation in a predetermined speed ratio, and
k. control means for said hydraulic motor mounted on said housing and connected to said second rotatable means for adjusting the rotational speed of said conveyor speed monitor shaft to rotate said idler shaft at the rotational speed of said ground speed monitor shaft, said second rotatable means being non-rotatable when said ground speed monitor shaft and said idler shaft are synchronized at the same rotational speeds.

3,929,293

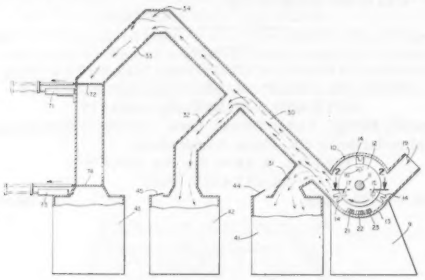
SHREDDER CRUSHER MATERIAL REDUCER

William F. Hahn, Devon, and Carl R. Graf, Whitehall, both of Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 360,998, May 16, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 185,760, Oct. 1, 1971, abandoned, and Ser. No. 267,915, June 30, 1972, abandoned. This application Sept. 17, 1974, Ser. No. 506,817

Int. Cl.[2] B02C *13/288, 18/40, 21/00*

U.S. Cl. 241—42 11 Claims



1. In a material reduction apparatus comprising a rotor housing, means for introduction of material into said housing, rotatable means mounted in said housing for subjecting said material to blows for reducing and propelling away from said rotatable means a stream of solid material including lighter and heavier pieces, and means for causing a flow of air to travel along with said stream of solids over at least a portion of the path covered thereby, the improvement which comprises means defining a first confined path away from said rotatable means for receiving said stream and for causing it to continue in motion in the direction in which it is impelled by the blows of the rotatable means, at least until it passes beyond at least one additional confined path, and means defining said at least one additional confined path diverging from and between the ends of said first path, said at least one additional confined path including means for diverting at least a portion of said flow and at least a portion of said light pieces together from said first path.

3,929,294

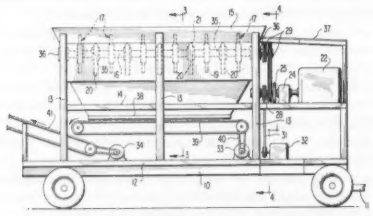
WASTE WOOD REDUCTION MACHINE

Ernest P. Cox, P.O. Box 154, Lolo, Mont. 59847

Filed Aug. 15, 1974, Ser. No. 497,667

Int. Cl.[2] B02B *5/02*; A01D *55/00*

U.S. Cl. 241—101.7 4 Claims



1. A waste wood reduction machine comprising a wheeled support, an open top hopper on the wheeled support, plural laterally spaced parallel wood reduction rotor shafts positioned in the upper portion of the hopper and extending longitudinally across the hopper from front to back thereof in relation to the path of movement of the wheeled support, plural axially spaced toothed wood reduction rotor heads on said shafts and turning therewith with the teeth of the rotor heads revolving in planes transverse to the axes of said rotor shafts, plural spaced parallel breaker bars in the upper portion of the hopper substantially at right angles to the axes of the rotor shafts and across said path of movement and disposed in planes parallel to said planes of revolution of said teeth, said plural breaker bars being continuous across said hopper and rotor shafts and having their ends supportively anchored to opposite sides of the hopper, said rotor shafts intersecting and extending through the breaker bars, bearing means for the rotor shafts on the breaker bars and fore and aft ends of the hopper, and power means on said machine drivingly connected with the rotor shafts to turn them in unison, said toothed wood reduction rotor heads intervened between pairs of said breaker bars.

3,929,295

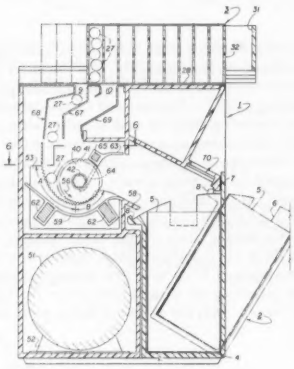
APPARATUS FOR DESTROYING SYRINGES AND LIKE ARTICLES

Anthony P. Montalbano, Glencove, N.Y., assignor to Madeline Ippolito, Great Neck, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,829

Int. Cl.[2] B02C *13/06, 19/14*

U.S. Cl. 241—190 58 Claims



1. Apparatus for destroying medical syringes, or like objects, comprising:

a plurality of rotatable members, each having a circumferential row of aligned serrations along at least a portion of the periphery thereof;

a plurality of stationary members, each having a row of aligned serrations over at least a substantial portion of a given surface thereof which faces the periphery of said at least one rotatable member; and

means for rotatably mounting each of at least a plurality of said rotatable members between respective pairs of adjacent stationary members;

said given surfaces of said stationary members having a shape which defines an entrance path between said rotatable members and said stationary members, said entrance path tapering from an entrance dimension larger than the maximum lateral dimension of said syringe or like object to a dimension at least substantially smaller than said maximum lateral dimension of said syringe;

said given surfaces of said stationary members having said serrations over at least a substantial portion of the portion thereof which defines said tapered entrance path;

said serrations having adjacent teeth which are closely spaced, the spacing between said teeth and the depth of said teeth being substantially less than the maximum lateral dimension of said syringe or like object.

3,929,296

STRIKING TOOL

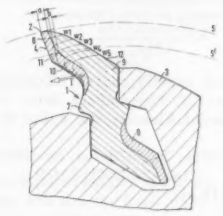
Hans Stöeber, Sonthofen, Germany, assignor to Hans Stöeber, Sonthofen, Germany

Filed Apr. 5, 1974, Ser. No. 458,311

Claims priority, application Germany, Apr. 7, 1973, 2317692

Int. Cl.² B02C *13/28*

U.S. Cl. 241—197 3 Claims



1. A striking tool for an impact and hammer crusher, the tool adapted to be mounted on a rotor supported in a bearing and operable to rotate the tool at high velocity into engagement with stones along a striking circle for crushing same, the tool comprising an impact head formed of a composite material comprising at least a pair of layers of material having an intimately bonded interface, one layer providing a working side of wear-resistant material having a striking edge, the other layer formed of a material resistant to bending and having a low wear resistance, and wherein the upper surface of said other layer substantially recedes relative to the striking edge of the working side at an acute angle relative to a plane tangential to the striking edge and generally normal to the striking circle.

3,929,297

AUTOMATIC WINDING MACHINE HAVING A CLAMPING DEVICE

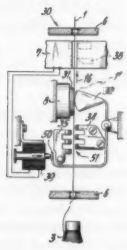
Heinz Zumfeld, Mönchen-Gladbach; Hermann Rutten, Viersen, and Nishit Bhattacharya, Mönchen-Gladbach, all of Germany, assignors to W. Schlafhorst & Co., Mönchen-Gladbach, Germany

Filed June 17, 1974, Ser. No. 480,093

Claims priority, application Germany, June 16, 1973, 2330707

Int. Cl.² B65H *63/00*

U.S. Cl. 242—36 4 Claims



1. In an automatic thread winding machine having thread tensioner means including a tensioning rocker acting upon a running thread being unwound from a supply coil, and sensing means specifically serving to monitor the presence of a broken thread, said tensioner means and said sensing means, respectively, being disposed in the path of travel of the thread being unwound from the supply coil, a clamping device controllable in accordance with the condition of the thread being unwound, and being adapted, in the event of a break in the thread, to grip the thread end coming from the supply coil, said clamping device formed by at least part of one of said means, and means also disposed in the path of travel of the thread for detecting a thread break and actuating said clamping device to grip the thread end coming from the supply coil.

3,929,298

ENDLESS TAPE TRANSPORTING DEVICE

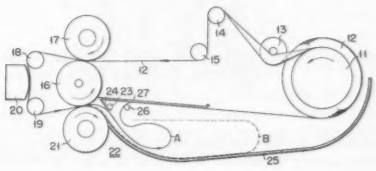
Satoshi Hara, Kanagawa; Morio Akino, Fujisawa, and Keizo Nakagawa, Chigasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 20, 1973, Ser. No. 399,250

Claims priority, application Japan, Sept. 22, 1972, 47-95591

Int. Cl.² B65H *17/48*

U.S. Cl. 242—55.19 R 10 Claims



1. An endless tape transporting device for transporting a tape at a high rate of speed comprising:

an endless tape reel adapted to coil an endless tape into a laminated coil so that the tape is delivered from the innermost of the laminated coil and wound on the outermost of the laminated coil;

a capstan and a pinch roller between which the tape is driven at said high rate of speed;

a loop buffer mechanism provided in a route in which the tape delivered from between the capstan and the pinch roller is wound on the reel, and having first, second and third guides;

said first guide being adapted to guide the tape so delivered in a direction in which the pinch roller is rotated and to deflect said tape toward said second guide so as to partially form a loop thereby;

said second guide being adapted to guide said tape from the first guide towards the reel in a curved manner; and

said third guide being adapted to cause the tape so guided to be reversed back in the direction of the first guide so that substantially one freely standing loop is created, and then to smoothly and freely guide it towards the reel,

whereby said smooth and free passage of said tape about said third guide means permits said loop to be adjustable in size so as to compensate for any variation in tension within said tape upon said reel and to maintain said tape properly tensioned.

3,929,299

APPARATUS FOR FORMING AND HANDLING REELS OF PAPER OR LIKE MATERIAL

Colin Walkington, Bristol, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Aug. 13, 1974, Ser. No. 497,003

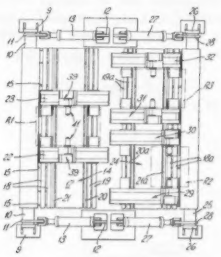
Claims priority, application United Kingdom, Aug. 15, 1973, 39556/73

Int. Cl.² B65H *17/08*

U.S. Cl. 242—65 14 Claims

1. Apparatus for handling reels of paper or like material comprising a pair of rotatable chuck means adapted to be inserted into opposite ends of a hollow core on which a reel is to be formed, a carrier for each of said chuck means, sup-

port means for each of said carriers, a platform, means for movably connecting said support means having a surface along which one of said carriers is arranged to be moved, a fixed mounting, means pivotally connecting said platform to said fixed mounting, the axis of said pivotal connection being parallel to the axis of said core when the latter is engaged by said chuck means, operating means connected to said platform, separate drive means extending between each of said support means and its associated carrier for moving said carriers along the respective surfaces of said support means, said carriers being arranged to be moved in one direction along the



respective surfaces on said support means by both said drive means during formation of the reel to a rest position prior to said operating means becoming operable, said operating means being operable after complete formation of the reel to cause said platform to move relative to said fixed mounting about said pivotal connection so as to move the completed reel to an unloading position, and control means adjacent at least one of said surfaces at said rest position for actuating said operating means and arranged so that actuation of said operating means is inhibited until said carrier has reached said rest position to actuate said control means.

3,929,300

LOCKING DEVICE

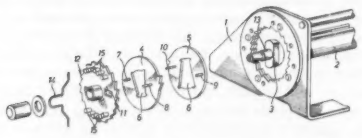
Karl Lindqvist, Hagavagen 14, S-171 53 Solna, Sweden

Filed Nov. 6, 1974, Ser. No. 521,237

Claims priority, application Sweden, Nov. 12, 1973, 7315301

Int. Cl.[2] B65H *75/48*

U.S. Cl. 242—107.4 **4 Claims**



1. In a locking device for locking a rotatable shaft or the like against rotation in one direction and having locking means and detecting means for measuring the angular acceleration of said shaft and for moving said locking means into a locking position with respect to said shaft to prevent further rotation of said shaft in said one direction when said angular acceleration reaches a predetermined magnitude;

a rotatable shaft having a portion of substantially rectangular cross sectional shape;

detecting means mounted on said portion of said shaft, said detecting means comprising at least one plate;

a substantially centrally disposed hole in said plate for receiving said portion of said shaft, said hole being substantially in the form of a trapezoid, said trapezoid having two substantially parallel sides of unequal length, the shorter one of said parallel sides being slightly longer than the shorter side of said rectangular portion of said shaft, the height of said trapezoid being slightly greater than the longer sides of said rectangular portion of said shaft;

whereby said plate can be rotated around said shorter one of said parallel sides of said trapezoidally formed hole therein from a normal position in which one of the non-parallel sides of said hole abuts one of the longer sides of said rectangular portion of said shaft to an activated position in which the other non-parallel side of said hole abuts the other longer side of said rectangular position of said shaft, in which last mentioned position said locking means achieves a locking position.

3,929,301

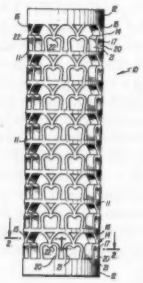
DYE TUBE FOR COMPRESSIVE PACKAGED DYEING

Fyans Frank, 252 S. Pleasantburg Drive, Greenville, S.C. 29606, and Steve I. Biroczky, Rte. 4, Box 463-A, Piedmont, S.C. 29673

Filed Feb. 18, 1975, Ser. No. 550,732

Int. Cl.[2] B65H *75/20*

U.S. Cl. 242—118.11 **17 Claims**



11. In a dye tube for compressive packaged dyeing, a pair of substantially rigid rings which are contained within the same cylindrical plane and are spaced apart axially along such plane, a web member joining said rings, said web member comprising a substantially rigid part which is directly connected with one of said rings and a yieldable part directly connected to and extending from the other said ring to join said first mentioned part, said yieldable part comprising a pair of leg portions which are curved outwardly relative to each other and meet where said parts join together.

3,929,302

PULLEY WHEELS

Joseph John Hurley, Paisley, Scotland, assignor to J & P Coats Limited, Glastow, Scotland

Filed July 31, 1973, Ser. No. 384,307

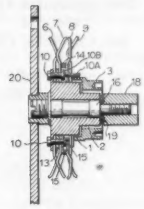
Claims priority, application United Kingdom, Aug. 5, 1972, 36651/72

Int. Cl. B65h *59/16*

U.S. Cl. 242—155 R **2 Claims**

1. A differential pulley incorporating a hub having a flange at one end and a screw-threaded portion at the other end, two co-axial pulley elements mounted on the hub and connected to one another, each pulley element presenting a circumferential groove, the pulley element adjacent the screw-threaded end of the hub comprising two dished pulley cheeks each formed with spokes so curved that opposite faces of the cheek present an annular convexity and an annular concavity respectively, the cheeks of said pulley element being so placed together that the faces formed with the annular convexities are adjacent one another with the spokes interlacing, the pulley cheek adjacent the screw threaded end of the hub being movable axially on the hub, and the other pulley cheek being fixed on the hub, leaf springs located to act between the cheeks and

urge the cheeks to move relatively apart, an axially movable abutment member arranged to act in opposition to the leaf springs formed as an internally screw-threaded stop ring engaged with the screw-threaded portion of the hub and presenting an end face engageable with the axially movable pulley



cheek and bolts disposed parallel to the axis of the hub penetrating the flange and also the fixed pulley cheek, one of the bolts at least being formed with an extension arranged to penetrate the axially movable pulley cheek so that the said movable pulley cheek cannot rotate relatively to the other cheeks.

3,929,303

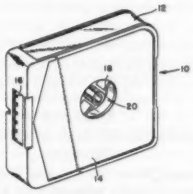
FILM CARTRIDGE WITH RETAINING RING AROUND A SUPPLY COIL

Robert C. Suthiff, 1669 Lake Ave., Rochester, N.Y. 14615

Filed Oct. 18, 1974, Ser. No. 768,849

Int. Cl. G03b *23/02*

U.S. Cl. 242—194 **11 Claims**



7. A cartridge for roll film, particularly for 8 millimeter motion picture film, comprising a housing defining a chamber for a supply of convoluted roll film which is rotatable in said housing; and a rigid confining ring loosely mounted in said housing and surrounding in its entirety the outermost convolution of the film in said chamber, said confining ring being rotatable in said housing in response to rotation of the supply of convoluted roll film in said chamber.

3,929,304

FILM CARTRIDGE

Francis A. Williams, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,296

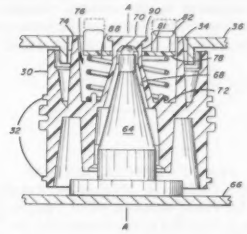
Int. Cl.[3] G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—194 **6 Claims**

1. In a cartridge for handling a photosensitive web strip and having means, including a generally cylindrical rotatable core for use in transporting said strip through said cartridge, said cartridge being receivable in a camera of the type having drive means for rotating said core and having actuatable clutch means for adjusting the driving force produced by said drive means; the improvement wherein said cartridge core carries means for applying an actuating force directed generally parallel to the axis of rotation of said core, said actuating means comprising:

means carried by said core for defining a support surface disposed between the opposite axial ends of said core and facing one of said ends;

plate member means disposed adjacent said one core end for entry into operable relationship with said camera clutch means when said cartridge is received in said camera;



means for mounting said plate member means for limited movement along said core axis; and

spring means supported by said support surface for moving said plate member means along said core axis away from said support surface to actuate said clutch to responsively adjust the driving force applied to said core.

3,929,305

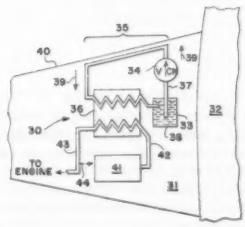
HEAT EXCHANGER SYSTEM AND METHOD

Alexander P. Sabol, Williamsburg, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Division of Ser. No. 301,419, Oct. 27, 1972, abandoned. This application Nov. 27, 1973, Ser. No. 419,319

Int. Cl. B64d *37/34;* **B64c** *1/00*

U.S. Cl. 244—117 A **1 Claim**



1. The combination of an aircraft and a heat exchanger system for the aircraft comprising:

a first reservoir for liquid coolant;

conduit means for conveying liquid coolant from said reservoir through a heating zone;

said heating zone comprising a leading edge of an airtoil surface on said aircraft,

means for preventing reverse flow of said liquid in said conduit means in a direction opposite to the flow therein from said first reservoir through said heating zone,

further conduit means for conveying said liquid coolant from said heating zone to said first reservoir and forming, with said first reservoir and the first mentioned conduit means a closed loop for circulation of said liquid coolant, cooling means located downstream of said heating zone for cooling heated liquid coolant prior to returning same to said heating zone,

said cooling means comprising a cooling unit through which the portion of the conduit means carrying the heated liquid passes before returning to said first reservoir,

a fuel tank disposed in said aircraft,

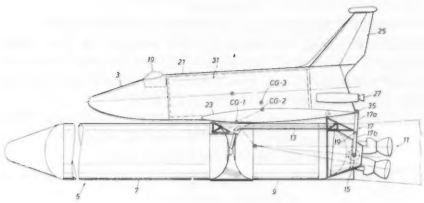
a fuel conduit leading from said fuel tank to the aircraft engine, and

said fuel conduit leading through said cooling unit and extending adjacent to the conduit means carrying the heated liquid, whereby heat from the heated fluid is transferred to the fuel in said fuel conduit within said cooling unit.

3,929,306
SPACE VEHICLE SYSTEM

Maxime A. Faget, Dickinson; William W. Petynia, Seabrook, and Willard M. Taub, Houston, all of Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Mar. 5, 1974, Ser. No. 448,323
Int. Cl.² B64G 1/00
U.S. Cl. 244—162 **18 Claims**



1. A space vehicle system consisting of an orbiter vehicle having an externally mounted propellant tank that is expendably affixed to a side thereof; the improvement comprising:

an engine module disposed proximate the aft end of the propellant tank and releasably communicating therewith so as to obviate the need for fuel lines into the orbiter vehicle fuselage, and

support and retraction means coupling the engine module to the orbiter vehicle so that the module may, subsequent to expenditure of the empty propellant tank, be retracted into the orbiter vehicle.

12. A method for increasing the payload area of a space vehicle system while simultaneously reducing the system weight and increasing the range and maneuverability for landing subsequent to re-entry, comprising the steps of;

providing a payload vehicle having its engine module disposed exteriorly of the fuselage, the fuselage being characterized by an aft opening therein,

releasably affixing to the exterior of the fuselage, in operative relation to the engine module, a propellant tank having fuel therein,

launching the vehicle system by actuating the engine module until the fuel in the tank is consumed,

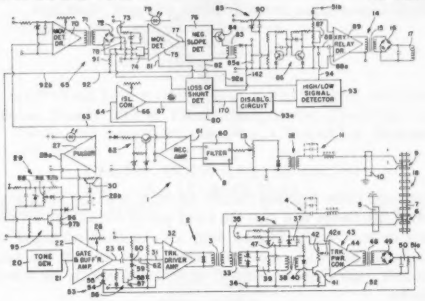
retracting the propulsion engine module into the opening in the fuselage and,

expending the propellant tank from the vehicle.

3,929,307
RAILWAY SIGNAL SYSTEM WITH SPEED DETERMINED MOVEMENT DETECTOR

Willard L. Geiger, Chagrin Falls, Ohio, assignor to Erico Rail Products Company, Solon, Ohio

Continuation-in-part of Ser. No. 348,944, April 9, 1973, Pat. No. 3,850,390. This application Apr. 5, 1974, Ser. No. 458,172
Int. Cl.² B61L 23/04
U.S. Cl. 246—130 **30 Claims**



1. A railway signal system for producing an output signal indicative of a train on a track approaching the system tie points to the track, comprising:

means for generating an AC signal, said means for generating including means for coupling the same to said track, whereby said AC signal is transmitted in said track;

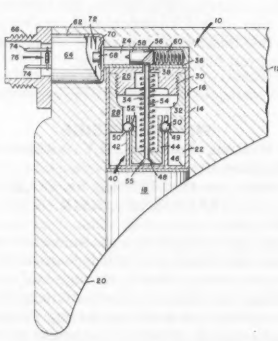
means for automatically regulating the current level of said AC signal; in accordance with variations in the track ballast; and

receiver means coupled to said track for receiving said AC signal from said track, said receiver means including means for detecting said AC signal to effect production of said system output signal in response to changes in said AC signal occurring due to such an approaching train.

3,929,308
LOCAL DERAILMENT SENSOR AND BRAKE ACTUATOR SYSTEM

John H. Armstrong, Silver Spring, and William W. Wassmann, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,480
Int. Cl.² B61K 9/04
U.S. Cl. 246—169 A **21 Claims**



1. A motion and temperature sensor system for detecting train wheel local derailment and actuating the brake system comprising:

a motion sensor activated by wheel impact with the roadbed;

a thermal sensor responsive to journal bearing temperature exceeding a predetermined value;

an output signal generator operatively coupled with and activated by said motion sensor and said thermal sensor; and

an electroexplosive means coupled to said signal generator for venting the brake system,

whereby the train brake system is applied to stop the train upon detection of wheel impact with the roadbed or journal bearing temperature exceeding a predetermined value.

3,929,309

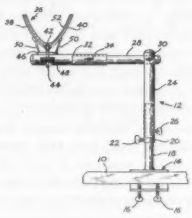
HEAD REST

Ellen G. De Vore, Medford, Oreg., assignor to Louis B. Pierce, Medford, Oreg.

Filed Aug. 26, 1974, Ser. No. 500,594

Int. Cl.² B68G 5/00

U.S. Cl. 248—118 **4 Claims**



1. A head supporting device adapted for use in conjunction with an overhead hair dryer, for enabling any user of the dryer, regardless of her facial contour, comfortably, conveniently, effortlessly and safely to rest her head removably in a chosen, substantially fixed relation to the dryer, said head supporting device comprising, in combination,

a. a chin and cheek engaging and conforming head supporting rest consisting of opposed, continuously upwardly divergent padded members for engaging opposite sides of the face,

b. means pivotally connecting the lower ends of said padded members to one another together with means for relatively adjusting said members to increase or diminish the angle of upward divergence formed between them for adaptation to different facial contours, said padded members having surface portions generated by a straight line segment moving parallel to the axis of rotation of said pivotal connecting means, and

c. adjustable supporting means for the head rest constructed and arranged to determine and control the height, the horizontal location and disposition, and the fore-an-aft tilt of the head rest.

3,929,310

BRACKET FOR SUPPORTING AN ORNAMENT

Engelbert J. Peham, 1263 Donohue Ave., St. Paul, Minn. 55104

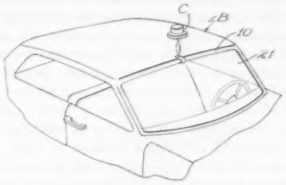
Filed Oct. 4, 1974, Ser. No. 512,069

Int. Cl.² B65A 77/10; A01D 57/02

U.S. Cl. 248—226 E **10 Claims**

1. An ornament support for use with an automobile having a windshield, a top, and a molding extending along the upper edge of the windshield, the molding having a lower edge adapted to substantially engage the windshield, an upper edge adapted to substantially engage the top of the automobile, the support including:

a resilient bracket including a lower end edge extending beneath the lower edge of said molding, an upper end including a stop shoulder extending over said molding and including a stop shoulder engaging the area between the upper edge of said molding and said top of said automobile, and a resilient rounded connection between the upper and lower ends of said bracket,



said bracket supporting a rod extending upwardly from the upper portion thereof, and

an ornament supported by the upper end of said rod.

3,929,311

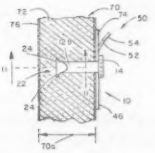
SUPPORTING FASTENER

Alan J. Solo, Brooklyn, N.Y., assignor to Knock-N-Lok, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 463,820, April 24, 1974, which is a continuation-in-part of Ser. No. 454,393, March 25, 1974. This application May 14, 1974, Ser. No. 469,666The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.

Int. Cl.² A47G 1/16

U.S. Cl. 248—217 **15 Claims**



1. A fastener for supporting a member on a surface of a penetrable material, said fastener comprising an elongate generally round shank, said shank having converging surfaces at one end thereof to form a cutting edge suitable for being driven through the penetrable material; an engageable head at the other end of said shank suitable for being hammered to advance said cutting edge and said shank through the penetrable material and for being engaged to permit turning of said shank about axis thereof; an anchoring portion in region of said cutting edge which projects laterally of said shank along a direction substantially normal to axial length of said shank to form therewith anchoring shoulders on diametrically opposing sides of said shank, said shoulders tapering from a major portion of said shank to form concave surfaces facing in the general direction of said head and merging with said cutting edge to form a point at each end thereof, said anchoring portion having a maximum transverse dimension and a maximum axial dimension, the ratio of said axial dimension to said transverse dimension being less than approximately 0.2, and the ratio of the diameter of said shank to said transverse dimension being approximately 0.5, said converging surfaces on said anchoring portion providing cutting surfaces sufficiently small to facilitate turning of said fastener after being driven into the penetrable material by engagement of said head with a suitable tool; said shoulders being sufficiently large to assure good anchoring of said fastener in the driven position due to engagement of said shoulders with the penetra-

ble material after said fastener is turned angularly about its axis relative to initial driven position; support means apertured to permit passage of said anchoring portion and said shank therethrough prior to entry of the fastener into the penetrable material, said support means being fixed in position between said head and a surface of the penetrable material in fully driven and turned position of said shank and anchoring portion, said supporting means including engaging means for engaging a corresponding portion of a member to be supported, whereby driving said shank into the penetrable material and turning the same about the axis thereof by engaging said head fixes the fastener in place and secures the member to the surface of the penetrable material; said support means further including a planar sheet of material having an aperture dimensioned to permit passage of said anchoring portion and said shank therethrough and prevent passage of said head, said engaging means including a tab projecting from a plane of said sheet and spaced from said aperture, said tab being inclined relative to the plane of said sheet and configurated to engage and support the member.

3,929,312

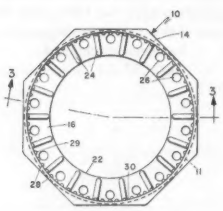
DIVER'S AIR TANK PROTECTIVE CAP

Alan K. Uke, 530 Couper Drive, San Luis Obispo, Calif. 92708

Filed June 28, 1974, Ser. No. 483,967

Int. Cl.² A47G 29/02

U.S. Cl. 248—346.1 **3 Claims**



1. A diver's air tank protective cap made of resilient plastic material for attachment to the lower end of a diver's compressed air tank, which cap can remain on the tank in storage or in use in the water comprising:

a cylindrical body having a wall with a length substantially less than the length of the tank and longitudinally extending internal ribs projecting inwardly from said wall for engagement with and gripping the sides of the tank,

the inner surface of the wall having water conducting channels between the ribs that are open at each end to allow water to flow directly therethrough,

said channels have a depth about equal to the thickness of said wall,

the bottom end of said body having a planar ground engaging circular rim,

said rim comprising a continuous band that extends radially inwardly forming a spaced centered opening,

said band having spaced ridges on the upper surface thereof for being contacted by the lower end of the tank,

said band having spaced holes therethrough communicating with said channels for letting water flow through said body and out the bottom end thereof,

said ridges extending from said wall radially inwardly toward the center of said opening,

said ridges being spaced around said band in equally spaced distances, and said spaced holes being positioned between each of said ridges,

said band having a thickness of said wall,

and the other end of said wall portion having an outwardly projecting flange that projects outwardly from the outer surface of said wall, which flange has outer edge surfaces having spaced flat portions for preventing rolling of said cap and diver's air tank.

3,929,313

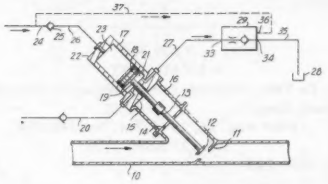
ANTI-BOTTOMING FLUID CONTROL SYSTEM

Russell V. Noah, Covina, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed July 31, 1974, Ser. No. 493,258

Int. Cl.² F16K 31/12

U.S. Cl. 251—28 **5 Claims**



1. An anti-bottoming fluid control system comprising a fluid supply passage having a valve seat, a valve member movable toward and away from said seat between sealing and opening positions of said passage, actuator means for moving said valve member between said positions including a hydraulic cylinder, a piston mounted in said cylinder and dividing the same into two chambers, said piston being operatively connected to said valve, first conduit means leading to one said chamber for introducing fluid into said chamber to shift said piston toward the sealing position of said valve, bleed conduit means leading to the other said chamber for conducting fluid expelled from said other chamber to a reservoir responsive to said movement of said piston toward said sealing position, and pressure sensing variable orifice restrictor valve means interposed between said bleed conduit and said reservoir for sensing the pressure in said bleed conduit and varying the flow resistance in the path between said conduit and reservoir directly in accordance with the pressure sensed in said bleed conduit.

3,929,314

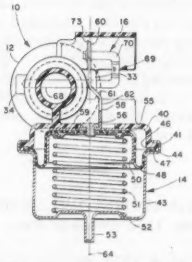
ACTUATING MEANS FOR A BUTTERFLY VALVE

Eugene Edward Stratynski, West Chicago, Ill., assignor to Eaton Corporation, Ohio

Filed June 8, 1973, Ser. No. 368,386

Int. Cl.² F16K 31/165

U.S. Cl. 251—58 **6 Claims**



1. A butterfly valve comprising:

a. a valve actuator having a movable plunger extending therefrom;

b. a valve body secured to said valve actuator, said valve body defining an open-ended, longitudinally-extending first chamber therein;

c. a rotatable butterfly plate within said chamber for controlling flow of fluid therein; and

d. a preformed, generally U-shaped actuating link connecting said plunger with said plate, said link having a first segment affixed to said plate, a third segment fixed to said plunger and an intermediate resilient second segment between said first and third segments, said second segment generally perpendicular to said first and third segments, said actuating link being disposed to rotate about an axis substantially parallel to said first segment, and said resiliency of said second segment permitting said second segment to flex in a direction perpendicular to said axis of rotation of said actuating link.

3,929,315

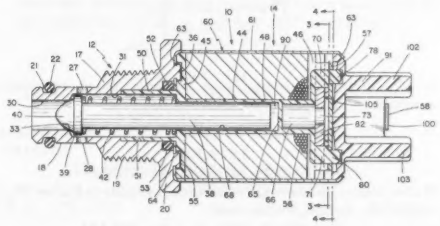
SOLENOID VALVE ASSEMBLY

Lawrence E. Rieth, Springfield, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed July 25, 1974, Ser. No. 491,817

Int. Cl.² F16K *31/06*

U.S. Cl. 251—129 **12 Claims**



1. A solenoid valve assembly, comprising; housing means, inlet port means in said housing means, outlet port means in said housing means, a valve seat between said inlet port means and said outlet port means, a valve member movable between a closed position blocking flow from said inlet port means and an open position permitting flow from said inlet port means to said outlet port means, said valve member including a plunger stem, a coil assembly surrounding at least a portion of said plunger stem, said coil assembly including a shell, said shell having a plurality of apertures receiving portions of said housing means for holding the coil assembly to the housing means, seal means between said housing and said coil assembly, said coil assembly including a sleeve surrounding said plunger stem, and an integral partition in said sleeve defining a stop for said plunger stem.

3,929,316

NON-FLOATING SEAT STRUCTURE FOR EXPANDING GATE VALVES

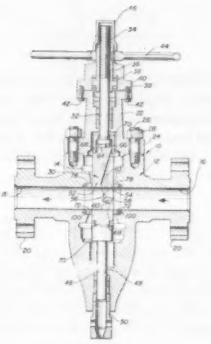
Larry E. Guthrie, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,825

Int. Cl.² F16K *25/00*

U.S. Cl. 251—196 **9 Claims**

1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, an expanding valve assembly including a gate element and segment slidably mounted within the valve chamber for movement between open and closed positions of the gate valve structure with said gate element and segment expanding away from each other at the fully open position, said valve body having an annular recessed portion about each flow passage and a circumferential groove in each of the recessed portions facing the valve chamber, generally cylindrical seats about said flow passages for engaging said gate element and segment in the open and closed positions of the gate element and segment, each seat having a circumferential groove in opposed relation to the groove in the adjacent flow passage and fitting within an associated recessed portion in face-to-face abutting contact with the associated recessed portion, and a deformable seal of an elongate cross section positioned within each pair of opposed grooves and filling between 80 and 100 percent of the total cross-sectional areas of the combined facing grooves when the seat is pressed within the associated recessed portion, said elongate seal having a width between around 105 and 130% of the total combined depth of the associated grooves and a thickness between around 70 and 90% of the



total thickness of the associated grooves, said seal upon being inserted within the opposed pair of grooves being deformed when the seat is in abutting contact with the associated recessed portion to fill substantially the entire cross-sectional area of the combined grooves and permitting face-to-face abutting contact between the seat and valve body without any portion of the seal being gripped between the opposed faces of the seat and valve body.

3,929,317

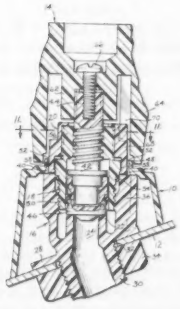
VALVE ASSEMBLY

Lawrence P. Cohn, Clarkston; Dennis W. Crawford, Pontiac, and Larry G. Turner, Waterford, all of Mich., assignors to Bristol Products, Inc., Bristol, Ind.

Filed Jan. 20, 1975, Ser. No. 542,279

Int. Cl.² F16K *31/44*

U.S. Cl. 251—223 **7 Claims**



1. In combination, a valve and attachment part; said valve including a body, a bonnet, a valve seat, a stem carrying a closure member engageable with said seat upon rotation of said stem, and a handle connected to said stem; said attachment part having an opening therein to accommodate said valve; the improvement wherein one of said attachment part

and body includes first slot means, said bonnet including a threaded part and second slot means, said body including a threaded part and being located at one side of said attachment part at said opening therein, said bonnet being located at the opposite side of said attachment part at its said opening with the stem projecting outwardly from said opposite attachment part side, the threaded part of said body interlocking with the threaded part of said bonnet to secure said body and bonnet to said attachment part, said first and second slot means being aligned, and retainer means extending into said aligned slot means for preventing rotation of said bonnet relative to said body.

3,929,318

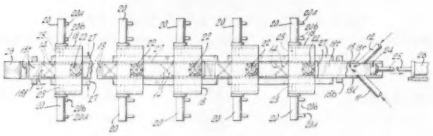
STATIC MIXERS FOR VISCOUS MATERIAL

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 9, 1974, Ser. No. 531,062

Int. Cl.² B01F *5/06, 15/02*

U.S. Cl. 259—4 **10 Claims**



8. A static mixer for mixing a fluid stream comprising:

a. a hollow elongated body member providing a mixing passageway for said fluid stream and having an inlet end for receiving said stream and an outlet end for discharging said stream after mixing therein, said passageway having slot openings through the walls thereof;

b. at least two mixing blade means, each of said blade means being disposed in a plane substantially normal to the walls of said passageway and at an angle from the longitudinal axis thereof, said mixing blades being disposed to obstruct a straight line fluid flow through said body member and provide a serpentine passageway therethrough; and

c. operator means connected to said mixing blade means for retracting said blade means through said slot openings in said body member walls whereby said blades are scraped clean and entirely removed from obstructing the passageway through said body member.

3,929,319

APPARATUS FOR PREPARING A DOUGH FROM A POWDERED MATERIAL AND A LIQUID

Willem Hendrik Willemsen, Westervalge 83, Warffum, Netherlands

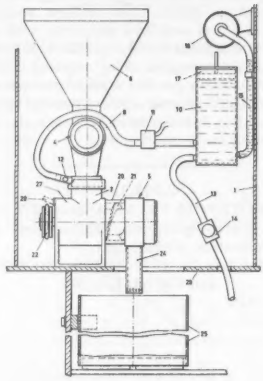
Filed Oct. 5, 1973, Ser. No. 404,008

Claims priority, application Netherlands, Oct. 5, 1972, 7213494

Int. Cl.² B01F *7/08*

U.S. Cl. 259—6 **4 Claims**

1. An apparatus for preparing a dough-like material from a powdered material mainly consisting of a starch-containing powder, thickening agents and binders, to which a liquid, preferably water, is added, said dough-like material being destined for the manufacture of so-called potato fries, croquettes and similar fried products, said apparatus comprising a feeding device for feeding a stream of said powdered material into a mixing device and a feeding device for feeding a stream of liquid into said mixing device, said mixing device having an outlet portion dispensing the mixture of powdered material and liquid in liquid state to a container in which said mixture stiffens to a dough-like material, said feeding device for said powdered material and said mixing device each including a worm adapted to be driven at a substantially constant speed, said worm of said feeding device for the powdered material and said worm of said mixing device each arranged



in a cylindrical housing, said housings being removably mounted in the apparatus.

3,929,320

FOUNDRY MIXING MACHINE

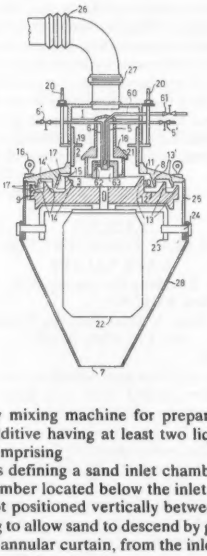
Walter Haller, Schlieren, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed May 6, 1974, Ser. No. 467,143

Claims priority, application Switzerland, May 7, 1973, 6411/73; Dec. 21, 1973, 18002/73; Dec. 21, 1973, 18003/73; Dec. 21, 1973, 18004/73; Apr. 9, 1974, 4984/74

Int. Cl.² B28C *5/16*

U.S. Cl. 259—165 **27 Claims**



1. A foundry mixing machine for preparing a mixture of sand and an additive having at least two liquid components, the machine comprising

a. wall means defining a sand inlet chamber, a preliminary mixing chamber located below the inlet chamber, and an annular slot positioned vertically between said chambers and serving to allow sand to descend by gravity, and in the form of an annular curtain, from the inlet chamber to the preliminary mixing chamber,

b. said slot being defined by cooperating walls which are movable relatively to each other to vary the width of the slot;

c. a feeding and spraying device in the preliminary mixing chamber and including a separate duct for each of said

liquid components and an additional duct for compressed air,

d. the ducts leading into the preliminary mixing chamber and being so arranged relatively to each other and to said slot that compressed air admixes the liquid components and propels the admixture into said annular curtain of sand which descends through said slot;

e. an annular final mixing chamber having an inlet at its inner margin which communicates with the preliminary mixing chamber at a region radially outward of said descending annular curtain of sand, and an outlet at its outer margin,

f. the final mixing chamber being defined by a gap bounded by two axially spaced, relatively rotatable bodies of revolution, each of which carries projections which extend toward the gap;

g. a drive motor located below, and connected to cause relative rotation of, said bodies of revolution; and

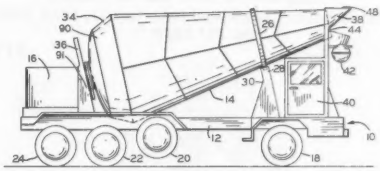
h. additional wall means which surrounds the bodies of revolution and defines a duct which leads mixture existing from the outlet of the final mixing chamber downward to an outlet located below said bodies of revolution.

3,929,321

CONCRETE MIXER BOWL AND METHOD FOR CONSTRUCTING SAME

Royal W. Sims, 6500 Holladay Blvd., Salt Lake City, Utah 84117

Filed Jan. 16, 1974, Ser. No. 433,550
Int. Cl.² B21D *51/10*
U.S. Cl. 259—175 **6 Claims**



1. A process for making a concrete mixer bowl container comprising the steps of: cutting complementary pairs of rectilinearly sided sections from flat sheet metal stock, bending such sections into arcuate shapes and simultaneously develop edges which are in a plane non-normal to the axis of rotation of the bowl, joining said complementary pairs of such sections to form complete conical circumferential sectors having at least one convexly shaped edge, interfitting intermediate confronting edges which are complementary convexly shaped edges of said complete circumferential sectors to form a larger conical sector and permanently joining the confronting convexly shaped surfaces of respective conical sections to form a container.

3,929,322

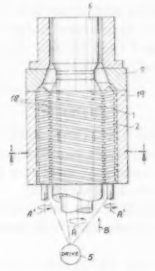
MULTISCREW EXTRUDER

Wilhelm Hanslik, Vienna, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Mar. 29, 1974, Ser. No. 456,251
Claims priority, application Germany, Apr. 7, 1973, 2317617
Int. Cl.² B29B *1/10*
U.S. Cl. 259—192 **7 Claims**

1. In an extruder for thermoplastic synthetic resin having a plurality of parallel auxiliary screws each formed with a respective auxiliary screw thread, and a central screw parallel to said auxiliary screws and formed with a respective central screw thread meshing with said auxiliary threads at meshing zones, said central thread defining a plurality of main flow passages between said zones and said auxiliary threads defining a plurality of auxiliary flow passages outside the respective zones, the improvement comprising:

means for rotating all of said screws about their axes with the same peripheral speed, said central and auxiliary screws having respective crown cylinders, the sum of the



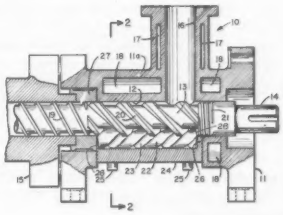
diameters of said crown cylinders of said auxiliary screws being substantially equal to the diameter of said crown cylinders of said central screw and the ratio of profile areas of the threads of the auxiliary screws to that of the threads of the central screw is in an inverse proportion to the ratio of their lengths.

3,929,323

EXTRUDER FEED SECTION

David J. Smith, Belle Meade, N.J., assignor to Egan Machinery Company, Somerville, N.J.

Filed Nov. 14, 1974, Ser. No. 523,815
Int. Cl.² B29B *1/10*
U.S. Cl. 259—192 **5 Claims**



1. A single screw extruder for processing hot melt plastic material which becomes tacky during processing, said extruder comprising:

a feed section housing having an extruder barrel connected thereto and a bore extending through said housing and said barrel;

means defining feed inlet and discharge outlet passages communicating respectively with the feed end and the discharge end of the bore;

an extruder screw rotatably mounted in said bore having a helical material processing screw thread portion in said extruder barrel, and a helical feed flight screw thread portion between said processing screw thread portion and said feed inlet passage having a running clearance with the wall of the bore to feed said material from said feed inlet passage to said material processing screw thread;

an auxiliary feed screw rotatably retained in the housing with its axis parallel to the axis of the extruder screw and having a helical groove whose helix is the reverse of and in mesh with said helical feed flight screw thread portion of the extruder screw;

means for drivingly connecting said extruder screw to means for rotating it;

there being a driving contact between the auxiliary feed screw and the flight screw thread portion of the extruder screw, and the auxiliary feed screw being rotatably driven solely by said feed flight screw thread portion of the extruder screw in opposite rotation to the extruder screw, and

said feed flight screw thread portion of the extruder screw and said auxiliary feed screw being coactive to feed said material from said feed inlet to the material processing portion of the extruder screw.

3,929,324

FLAME CUTTING MACHINE

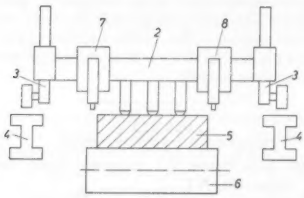
Horst K. Lotz, Wallau, BRD, and Bernhard Otto, Klein-Winternheim, both of Germany, assignors to GeGa Gesellschaft fur Gasetechnik Lotz KG, Germany

Filed Nov. 9, 1973, Ser. No. 414,208

Claims priority, application Germany, Nov. 9, 1972, 2254795

Int. Cl.² B23K *7/10*

U.S. Cl. 266—23 K **7 Claims**



1. A flame cutting machine for cutting strands produced in continuous casting plants, said machine comprising a carriage, at least one cutting torch mounted to said carriage, means mounting said carriage for movement above said strand for a distance along the path of movement of said strand, means for selectively transferring substantially the entire weight of said carriage to said strand to connect said carriage to said strand to produce synchronous movement of said strand and said carriage, said last mentioned means being engageable only with the upper surface of said strand and comprising at least one bearing member and means selectively moving said bearing member into engagement with the upper surface of said strand to frictionally engage said strand to be driven by said strand and thereby produce synchronous movement of said carriage with said strand.

3,929,325

PIPE HOLDING APPARATUS

Chester A. Eastwood, 2202 River Road, and Clyde A. Eastwood, 2311 River Road, both of Yakima, Wash. 98902

Filed July 22, 1974, Ser. No. 478,186

Int. Cl.² B25B *1/20*

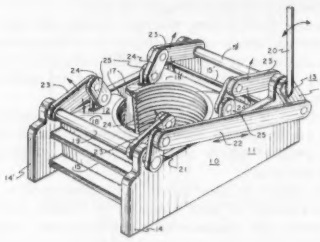
U.S. Cl. 269—218 **2 Claims**

1. A pipe holding apparatus comprising:

a base including a pair of parallelly, upstandingly, rectilinearly disposed walls, and a pair of parallelly, transversely, substantially upstandingly disposed walls;

a chuck including a pair of upstanding, semicircular jaws together forming a ring-like configuration about a pipe, and substantially rectangular blocking plates disposed about the exterior terminal sides of said jaws, said jaws having means for riding within said base; and

an actuator assembly including a pair of axles journally transversely carried distally from the terminal ends of said rectilinear walls, one of said axles having a first lever and a linkage arm fixedly fastened thereto, said lever providing means to rotate said one axle, the opposing axle having a second linkage arm fixedly fastened to one of the terminal ends of said opposing axle, a linkage rod pivotally mounted to said first and second linkage arms at the opposite ends of said rod, each of said axles having a pair



of fixedly mounted interiorly disposed upwardly inclined linkage arms, said interior linkage arms having pivotally mounted second linkage rods disposed at their ends opposite said axles, said second linkage rods being pivotally mounted to capstans disposed on the uppermost terminal side of said blocking plates of said chuck.

3,929,326

DEVICE FOR ACCUMULATING AND SUPPLYING LENGTHS OF MATERIAL IN SHEET FORM

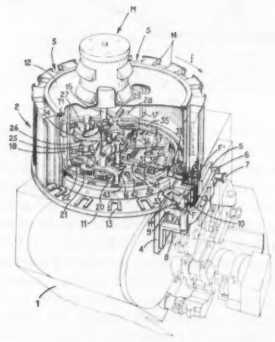
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed May 29, 1974, Ser. No. 474,441

Claims priority, application Italy, July 11, 1973, 3449/73

Int. Cl.² B65H *7/14*

U.S. Cl. 271—3.1 **5 Claims**



1. A device for accumulating and supplying material in sheet form or in cuttings which operates in conjunction with a fixed reception chamber so that the material is successively supplied to the fixed reception chamber and then supplied to a wrapping mechanism of a wrapping machine, comprising:

a body, having an outer periphery, a portion of the outer periphery being disposed above the fixed reception chamber, said body being movable such that different portions of the outer periphery thereof come into alignment with the fixed reception chamber as the body moves;

a plurality of body compartments provided along the outer periphery of said body, each of said compartments including means for receiving and containing a pile of material;

moving means for causing said body to move intermittently so as to cause said body compartments to halt, one at a time, in alignment with the fixed reception chamber;

a plurality of movable support means, each being contained in one of said plurality of body compartments, for supporting a pile of material within each respective body compartment, wherein said plurality of movable support means are movable radially with respect to said body and are provided with a member which cooperates with an operating device and works in conjunction with said moving means for intermittently operating said body, in order that said plurality of movable support means can be displaced radially from a support position within the compartments to one whereby the pile of material in the particular compartment located above the fixed reception chamber can be discharged therein, said plurality of movable support means engaging with a fixed rail so as to maintain stable their support position for the piles of material in all the other positions; and

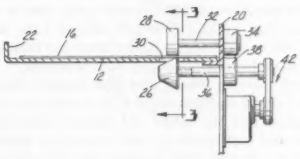
sensing means sensitive to the level of the pile of material inside the fixed reception chamber for activating said moving means and, after one of said body compartments has halted in alignment with the fixed reception chamber, causing the movable support means thereof to release the material contained in said body compartment so as to allow transfer of material into the fixed reception chamber.

3,929,327

DOCUMENT TRANSPORT AND REGISTRATION APPARATUS

Lorin P. Olson, Tustin, Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Apr. 1, 1974, Ser. No. 457,072
Int. Cl.² B65H 9/16
U.S. Cl. 271—250 **10 Claims**



5. An apparatus for transporting documents in a predetermined direction of travel, said apparatus comprising:

a document support surface extending in the direction of travel,

an edge member mounted on one side of said support surface and defining a document registration edge generally parallel to the direction of travel,

a drive shaft mounted generally parallel to said support surface,

a single drive roller mounted to said drive shaft adjacent said support surface and being of generally hollow, tapered decreasing radius configuration open at the larger radius end,

drive means for rotating said shaft about the axis of said roller,

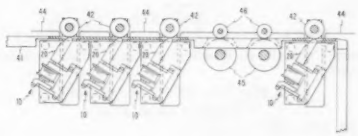
said drive roller being of flexible, resilient construction having a continuous peripheral drive surface adjacent said open end, a portion of said peripheral drive surface engaging a presented document in an area, said portion being deformed radially inward while in engagement with said document, said area being asymmetric with respect to said direction of travel whereby said roller creates a couple influencing the trailing end of the document toward said registration edge during transport, said drive roller being of generally frusto-conical configuration with said open end facing toward said registration edge.

3,929,328

DOCUMENT TRANSPORT DEVICE

LaVerne Frank Knappe, Rochester; Lee Philip Sapetta, New Brighton; Gary John Stroebel, and Myron Arden Wilke, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,493
Int. Cl.² B65H 5/16
U.S. Cl. 271—267 **11 Claims**



5. A document transport device for moving a document along a device surface which defines a document path comprising

a base member;

a pair of parallel spaced flexure mounting means each supported by and extending from said base member;

an elongated elastomer member connected at one end to the first of said parallel flexure mounting means at a surface facing away from the second of said parallel flexure mounting means;

said elongated elastomer member presenting a surface at the distal end thereof in confronting relation to said device surface;

rigid interconnecting means secured to said elongated elastomer member and to the second of said pair of said parallel flexure mounting means; and

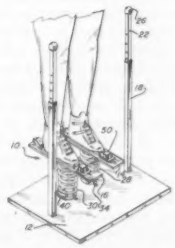
electromechanical transducer means for imparting to said elongated elastomer member an oscillatory vibratory motion as a periodic rotation and translation which causes said elastomer member surface to process through an elliptical path and propel a document disposed between said elastomer member surface and said device surface along said document path.

3,929,329

APPARATUS FOR TESTING SKI BOOT FIT

Richard L. Rivera, 480 S. Marion Parkway, Apt. 101, Denver, Colo. 80209

Filed Aug. 5, 1974, Ser. No. 494,534
Int. Cl.² A63B 69/18
U.S. Cl. 272—57 D **4 Claims**



1. Apparatus for the checking and verification of feel and fit of a pair of ski boots to the feet of a wearer under conditions simulating those of actual use on the ski slopes which comprises in combination;

a stationary base member;

a pair of coil springs mounted on said base member in side-by-side relation with the axes of the coils near parallel, said springs being mounted for limited rotational

movement about said axes in a horizontal plane, as well as bending movement forward and backward and from side-to-side to provide three degrees of freedom of movement; and,

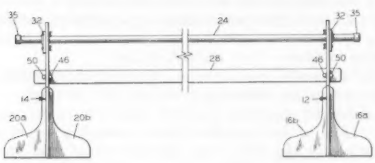
a foot support platform attached to the upper extremity of each spring to lie generally near the same plane, each said foot platform having a ski binding attached to the upper surface thereof to secure thereto a pair of ski boots therein in side-by-side skiing relation.

3,929,330

PARALLEL WALKING BAR ASSEMBLY

Anthony Cerasoli, 46 Woodmont Road, West Hartford, Conn. 06117

Filed Mar. 11, 1974, Ser. No. 449,951
Int. Cl.² A63B *3/00*
U.S. Cl. 272—63 **1 Claim**



1. A readily assembled and disassembled parallel walking bar assembly comprising:

a. a first base support having front and rear surfaces which define parallel planes and including a first leg and a second leg interconnected by a central portion, each of said first and second legs having a multiplicity of holes intersecting said surfaces and having axes substantially perpendicular thereto in suitably spaced relation relative to each other, each of said first and second legs further having slot means formed therein in spaced relation to said multiplicity of holes, said first base support also including planar portions extending outwardly therefrom at an angle to the said surfaces thereof operable for maintaining said first base support in an upstanding position on a planar surface, said portions comprising foot members extending outwardly on each side of said first leg and said second leg of said first base support substantially at right angles thereto;

b. a second base support spaced from said first base support and having the front and rear surfaces thereof defining planes parallel to the planes defined by said first base support, said second base support including a first leg and a second leg interconnected by a central portion, each of said first and second legs having a multiplicity of holes intersecting said surfaces and having axes substantially perpendicular thereto in suitably spaced relation relative to each other, each of said first and second legs further having slot means formed therein in spaced relation to said multiplicity of holes, said second base support also including planar portions extending outwardly therefrom at an angle to said surfaces thereof operable for maintaining said second base support in an upstanding position on a planar surface, said portions comprising foot members extending outwardly on each side of said first leg and said second leg of said second base support substantially at right angles thereto;

c. first bracket means detachably secured on said first base support in one of a plurality of adjustable positions relative to said first base support, said first bracket means including a first pair of brackets, one of said first pair of brackets being detachably mounted on said first leg of said first base support by means of said multiplicity of holes formed in said first leg of said first base support, and the other of said first pair of brackets being detachably mounted on said second leg of said first base support by means of said multiplicity of holes formed in said second leg of said first base support so that by selectively employing different pairs of said multiplicity of holes to mount said first pair of brackets on said first and second legs of said first base support the position of said first pair of brackets relative to said first base support may be adjusted;

d. second bracket means detachably secured on said second base support in one of a plurality of adjustable positions relative to said second base support, said second bracket means including a second pair of brackets, one of said second pair of brackets being detachably mounted on said first leg of said second base support by means of said multiplicity of holes formed in said first leg of said second base support, and the other of said second pair of brackets being detachably mounted on said second leg of said second base support by means of said multiplicity of holes formed in said second leg of said second base support so that by selectively employing different pairs of said multiplicity of holes to mount said second pair of brackets on said first and second legs of said second base support the position of said second pair of brackets relative to said second base support may be adjusted;

e. a first walking bar having one end thereof supported by said one of said first pair of brackets on said first base support and the other end thereof supported by said one of said second pair of brackets on said second base support so that said first walking bar is detachably supported by said first and second base supports substantially at right angles to the front and rear surfaces of each of said first and second base supports;

f. a second walking bar having one end thereof supported by said other of said first pair of brackets on said first base support and the other end thereof supported by said other of said second pair of brackets on said second base support so that said second walking bar lies in the same horizontal plane as said first walking bar and is detachably supported by said first and second base supports substantially at right angles to the front and rear surfaces of each of said first and second base supports;

g. a first rail member having one end thereof detachably received in said slot means of said first leg of said first base support and the other end thereof detachably received in said slot means of said first leg of said second base support so that said first rail member extends between said first and second base supports substantially at right angles to the major axis of each of said first and second base supports and in spaced relation to said first walking bar, said first rail member being provided at each end thereof with a pair of dowel pins, one of said pair of dowel pins being removable to permit the ends of said first rail member to be received in said slot means, said one of said pair of dowel pins thereafter being repositioned so that a portion of the corresponding one of said first and second base supports is captured between said pair of dowel pins, said first rail member being operable to increase the rigidity of the parallel walking bar assembly;

h. a second rail member having one end thereof detachably received in said slot means of said second leg of said first base support and the other end thereof detachably received in said slot means of said second leg of said second base support so that said second rail member is spaced from said second walking bar and lies in the same horizontal plane as said first rail member and extends between said first and second base supports substantially at right angles to the major axis of each of said first and second base supports, said second rail member being provided at each end thereof with a pair of dowel pins, one of said pair of dowel pins being removable to permit the ends of said second rail member to be received in said slot means, said one of said pair of dowel pins thereafter being repositioned so that a portion of the corresponding

one of said first and second base supports is captured between said pair of dowel pins, said second rail member being operable to increase the rigidity of the parallel walking bar assembly; and

i. additional support means cooperatively associated with each of said first and second walking bars to impart additional support thereto intermediate the ends thereof and positionable intermediate said base supports, said additional support means comprising a pair of stanchions, one of said pair of stanchions being cooperatively associated with said first walking bar and the other of said pair of stanchions being cooperatively associated with said second walking bar, each of said pair of stanchions including a lower portion terminating at one end in an enlarged base supportable on a planar surface, and an upper portion terminating at one end in a ring-like element operable for receiving therethrough one of said first and second walking bars, said upper portion being supported on said lower portion for sliding movement relative thereto to enable said upper portion to be adjusted relative to said lower portion so that the height of said ring-like element corresponds to the height of said first and second walking bars.

3,929,331

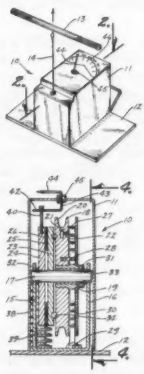
EXERCISE DEVICE

Jack D. Beeding, Rockford, Ill., assignor to E. Dale Mask, Milwaukee, Wis. and Ernest M. Mattox, Independence, Mo., a part interest to each

Continuation of Ser. No. 355,554, April 30, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,382

Int. Cl.² A63B *21/00*

U.S. Cl. 272—79 D **5 Claims**



4. In an exercising device, the combination of, first and second members disposed in facing relation, said members being supported for relative turning about a predetermined axis and also being supported for relative bodily shifting, means operable to turn said first member in one direction relative to said second member when said means are moved manually during the performance of an exercising operation, a series of raceways formed in the opposing faces of said members and positioned such that the raceways of one member are substantially alined with the raceways of the other member, spreading devices captivated within the alined raceways and operable to force said members apart when said first member is turned relative to said second member in said one direction, and braking means operable to automatically retard movement of said manually movable means when said members are forced apart by said spreading devices.

3,929,332

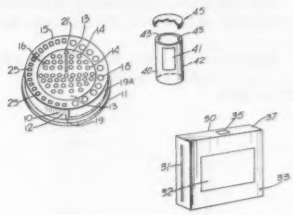
CARDS, MAGNETIC MOUNTING MEMBERS AND ROTATABLE HOLDER

Donald A. Kidd, 2711 Octavia St. No. 302, San Francisco, Calif. 94123

Filed Mar. 10, 1975, Ser. No. 557,234

Int. Cl.² A63F *9/00*

U.S. Cl. 273—1 M **1 Claim**



1. An educational game utilizing two sets of marked cards in which the purpose of the game is to match a card of one set with an appropriately marked card of the other set of cards, in which each of one set of cards are installable in each of a first set of objects, and each of the other set of cards are installable in each of a second set of objects, with each of the objects of both sets fitted with a window opening for displaying the marking of an installed card, together with a holder fitted with shaped recesses for individually retaining the objects so as to conceal the window opening of each retained object, each holder is rotatably mounted on a base, and each object is fitted with a magnetic attractable piece of material, together with a pick fitted with a tip of magnetic material so that the pick can remove an object from the recess of the holder by magnetic attraction.

3,929,333

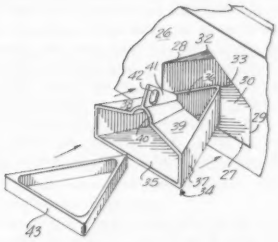
POOL TABLE AND QUICK RACK SYSTEM

Jacob Kremski, 10440 South State Road, Goodrich, Mich. 48438

Continuation-in-part of Ser. No. 496,182, Aug. 9, 1974, abandoned. This application Feb. 28, 1975, Ser. No. 553,992

Int. Cl.² A63D *15/00*

U.S. Cl. 273—22 **3 Claims**



1. A pool table and quick rack system therefor, said table having pockets opening into a plurality of ball return channels positioned beneath the table, an aperture formed in said table adjacent one end thereof, a bottom wall in said aperture positioned to underlie the discharge end of said channels, said rack system comprising a triangular rack carrier removably positioned in said aperture on said bottom wall, said rack carrier including a triangular bottom wall, a pair of generally upright forwardly converging side walls joined at the forward portion of said carrier, a handle for moving said carrier, a triangular rack removably positioned in said carrier, and

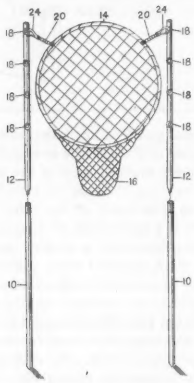
means integral with said handle extending between said side walls and integral therewith for supporting said handle substantially above the triangular bottom wall sufficiently to permit movement of said rack into and out of said carrier with one or more balls supported on the balls lying on said triangular bottom wall.

3,929,334

MECHANICAL BASEBALL UMPIRE

Ronald A. Magazzu, R.D. 4 Dolly Bridge Road, Randolph, N.J. 07801

Filed Sept. 18, 1974, Ser. No. 507,143
Int. Cl.² A63B *69/40*
U.S. Cl. 273—26 A **3 Claims**



1. A mechanical baseball umpire comprising:

a pair of elongated vertical support posts spaced a preselected distance apart, each having a series of vertically spaced eye bolts attached thereto intermediate its ends; a net structure, said net structure having a net member formed as a pocket having a closed bottom portion and an open top portion, said top portion being secured around the periphery of a loop to form an open pocket, said loop having a pair of elongated suspension members attached thereto, each of said suspension members having means at its free end to fasten said suspension members to eye bolts for suspending said loop and net from said pair of posts such that said loop lies in a substantially vertical plane between said post, said fastening means being disengagable from said eye bolts for vertically adjusting said loop and net on said posts, said post net and loop arrangement serving as an umpire in the sense that when a ball is thrown through the loop and retained by said net a "strike" is designated and when a ball does not pass through said loop a "ball" is designated.

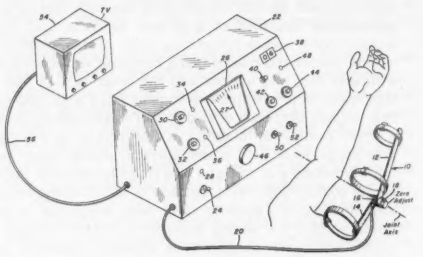
3,929,335

ELECTRONIC EXERCISE AID

Franklin S. Malick, 518 Greenleaf Drive, Monroeville, Pa. 15146

Filed Feb. 10, 1975, Ser. No. 548,514
Int. Cl.² A63B *23/00*
U.S. Cl. 272—57 R **8 Claims**

1. Apparatus for motivating a patient in need of occupational therapy comprising a hinged device adapted to be operatively associated with a joint of a patient and having a transducer coupled thereto for producing an electrical signal which quantitatively increases on either side of a central, null position of the hinged device, first and second comparator devices for comparing said electrical signal with a pair of bias signals such that an output will be produced from each comparator device when said electrical signal equals or exceeds an associated bias signal upon movement of the hinged device in either direction from said central, null position, an electrically-



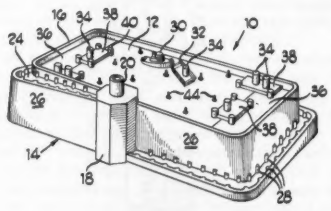
operated motivation device, and means for deactivating said motivation device in the absence of an output from either of said comparator devices for a predetermined period of time.

3,929,336

SURFACE PULLING APPARATUS WITH OBSTACLE SIGNALING

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 9, 1973, Ser. No. 404,286
Int. Cl.² A63F *9/00*
U.S. Cl. 273—108 **13 Claims**

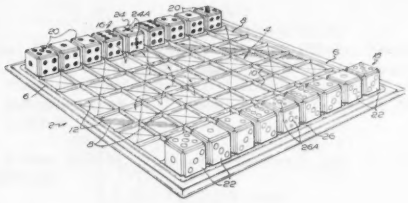


1. A game apparatus, comprising: means defining a playing surface; means defining a starting position on the playing surface; means defining an ending position on the playing surface; means defining an obstacle course between said positions including a plurality of obstacles protruding upwardly from said playing surface between said positions defining plural alternate paths of travel between the obstacles; a hand manipulatable first playing piece having bottom surface means engageable with said playing surface during play, and said playing surface between the obstacles being generally flat and devoid of any guiding influencing structure for said playing piece and allowing for manual pushing by a player of the playing piece freely in any direction on the playing surface over said obstacle course between said upwardly protruding obstacles; a freely movable second playing piece which is capable of being pushed over said playing surface by the first playing piece so as to move the second playing piece along said obstacle course between the upwardly protruding obstacles; and hazard warning means to signal when one of said playing pieces deviates from said obstacle course and engages one of said obstacles.

3,929,337
BOARD GAME APPARATUS

Geoffrey Hayes, Prestbury, England, assignor to Toy Development Limited, England

Filed Feb. 5, 1975, Ser. No. 547,200
Claims priority, application United Kingdom, Feb. 7, 1975, 5771/75
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 C **3 Claims**



1. Apparatus for playing a game comprising the combination of

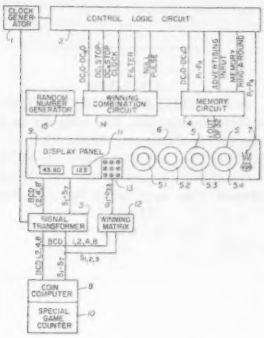
1. a first set of equal size dice, one die of the set having all its faces presenting the same symbol, all the other dice in the set being marked with symbols of different numerical value whereby each face of a die bears a symbol of different value from the symbols on the other faces of the die,
2. a second set of dice equal in size and number to the first set of dice, the second set of dice being marked in the same manner as the first set of dice, the second set of dice having at least one common characteristic that enables any die of the set to be readily distinguished from any die of the first set,
3. means providing a playing surface divided into contiguous and aligned squares of equal sizes, each square being of substantially the same size as a die face, the playing surface having sufficient squares to permit the first set of dice to be aligned in a row parallel to a row of the second set of dice with a plurality of squares being vacant to accommodate movement of the dice,
4. and means for indicating the symbol to be presented by the uppermost face of a die in a new position on the playing surface when the die is moved from its initial position to its new position along a permitted path having the number of squares equal to the numerical value that is on the uppermost face of the die in the initial position.

3,929,338
GAMING APPARATUS

Juergen Peter Busch, Bingen, Germany, assignor to NSM Apparatebau GmbH Kommanditgesellschaft, Bingen (Rhine), Germany

Filed Dec. 26, 1973, Ser. No. 428,344
Claims priority, application Germany, Dec. 27, 1972, 2263570
Int. Cl.² A63B *71/06*
U.S. Cl. 273—138 **6 Claims**

1. A control and indicator apparatus, comprising a first group of a plurality of display devices, first and second counters, a clock generator connected to apply clock pulses to said first and second counters, shift register means, means for selectively applying the output of said counters to said shift register means, and decoder means coupled to determined stages of said shift register means for controlling said display devices, said means for selectively applying the outputs of said counters to said shift register means comprising first and second AND-gate means connected to the outputs of said first and second counters respectively, means for selectively operating said first and second AND-gate means, OR-gate means coupling the output of said second AND-gate means to said shift register means, a plurality of third AND-gate means coupling the output of said first AND-gate means to said

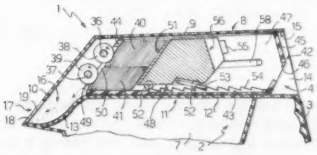


OR-gate means and means for selectively opening the AND-gate means of said plurality of AND-gate means.

3,929,339
DEVICE FOR DISTRIBUTION OF PLAYING-CARDS

Luciano Mattioli, Milan, Italy, assignor to S.I.T.A.V. S.p.A. - Societa Incremento Turistico Alberghiero Valdostano, Aosta, Italy

Filed Sept. 9, 1974, Ser. No. 505,191
Claims priority, application Italy, Sept. 28, 1973, 29494/73
Int. Cl.² A63F *1/14*
U.S. Cl. 273—148 A **4 Claims**



1. A device for distribution of playing-cards, the device comprising:

a cavity;

magazine means for accommodating at least two separate packs of cards arranged in a superimposed and on-edge relationship, and with each card of one pack arranged with one of its edges in contact with a corresponding edge of a card of the other pack, said magazine means being mounted to be slidable along at least part of said cavity; first aperture means for communication of said cavity with the outside, said first aperture means facing an end wall of said magazine means;

compression means arranged within said magazine means for engaging the bottom card of each pack of cards, and pushing said packs of cards towards said end wall;

second aperture means provided through said end wall to enable the cards to come out from said magazine means;

movable retainer means adapted to extend through said second aperture means into said magazine means and into contact with the top card of each pack of cards to support said packs of cards against the action of said compression means; and

means for operating said movable retainer means in a step-by-step manner, said movable retainer means being adapted, when operated, to exert a grazing action on each of said top cards, and said grazing action tending to cause, at each step, at least said top card of each pack to slide

relative to the remaining cards towards said first aperture means through said second aperture means, and into a position in which it can be drawn from the outside through said first aperture means.

3,929,340

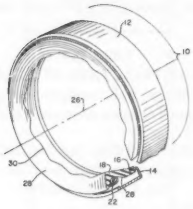
SEAL WITH PUMPING ACTION

Glenn W. Peisker, Barrington, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation of Ser. No. 246,865, April 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,693, Dec. 29, 1971, abandoned. This application Nov. 11, 1974, Ser. No. 522,883

Int. Cl.² F16J *15/32*

U.S. Cl. 277—134 **9 Claims**



1. An oil seal unit for creating a fluid seal between a pair of relatively movable elements, at least one of which is arranged for rotation about a given axis, and unit having a mounting portion thereof adapted to be fixedly associated in use with the first of said elements, and a generally annular, flexible primary lip portion disposed in a position of use, in a generally facing relation to said second element and defined at least partially by converging first and second, at least partially axially undulating frusto-conical lip surfaces meeting each other along an axially undulating seal band area formed at the convergence of said undulating lip surfaces, said seal band undulating so as to have portions thereof lying on either side of an imaginary plane lying parallel to the plane of said seal mounting portion and substantially perpendicular to said given axis of said movable member, said first lip surface at least partially facing the surface of said second element lying on the exterior of a region in which a fluid is to be sealed, and said second lip surface at least partially facing the surfaces of said second element lying on the interior of said region in which said fluid is to be sealed, the included angle between said first lip surface and the surface of said second element being from about 15° to about 30° and the included angle between said second lip surface and the surface of said second element being from about 40° to about 60°, said angles being measured as said seal is in a normally installed position of use over said second member, each of said angles being substantially constant throughout the circumferential extent of said lip surfaces, with the amplitude of said seal band undulations being from about 0.003 inches to about 0.015 inches to either side of said imaginary plane, and with said seal band area of said seal as said seal is formed being of substantially constant radius throughout its entire extent.

3,929,341

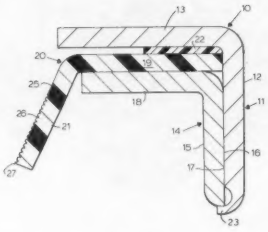
METHOD OF MAKING POLYTETRAFLUOROETHYLENE SEALING ELEMENTS WITH HYDRODYNAMIC ACTION

William E. Clark, Chelsea, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 426,365, Dec. 19, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,451

Int. Cl.² B61F *15/22;* **F16J** *15/54*

U.S. Cl. 277—134 **19 Claims**



1. A method for manufacturing an oil seal having an element made from a tubular billet of polytetrafluoroethylene or the like having an outer cylindrical surface, a concentric inner cylindrical surface, and an annular body between said cylindrical surfaces, comprising the steps of:

facing off one end wall perpendicular to said cylindrical surfaces,

slicing said billet at a desired thin distance from said faced end wall to provide a washer and to provide a newly faced end wall which is thereafter sliced, proceeding thusly through said billet to provide a plurality of said washers, and

coining one face of each said washer to provide hydrodynamic means for returning oil, leading from the intersection of said wall with its inner cylindrical surface and extending for a desired width.

17. A method for manufacturing an hydrodynamic oil seal element from a generally flat wafer of polytetrafluoroethylene or the like, comprising the steps of:

substantially simultaneously blanking and piercing said wafer to provide the desired inner and outer dimensions, and

coining one face of said wafer to provide hydrodynamic means for returning leaked fluid, leading from its inner periphery and extending for a desired width.

3,929,342

SPREADER SPRING FOR PISTON RINGS

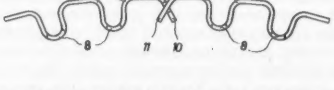
Martin Morsbach, Hilgen; Paul Jöhren, and Hermann Meuken, both of Burscheid, all of Germany, assignors to Goetzewerke, Burscheid, Germany

Filed June 13, 1975, Ser. No. 586,725

Claims priority, application Germany, June 22, 1974, 2430072

Int. Cl.² F16J *9/06*

U.S. Cl. 277—141 **1 Claim**



1. A spreader spring for disposition in a piston groove for urging piston rings outwardly of the piston groove into engagement with a cylinder wall; the spreader spring being formed of a resilient strip bent annularly and having radially oriented corrugations and two adjoining spring strip ends; each spring

strip end has a cutout extending axially from a strip edge; the cutouts in the two strip ends being oriented, with their open side, in opposite axial directions; each cutout having an axial dimension that is at least one half the width of the spring strip; the improvement wherein said strip ends are oriented towards one another and are angularly bent at an angle of 0°–90° with respect to the tangent of the annular spring strip in the location of bend; said cutouts being disposed in the bent portions of said spring strip ends.

3,929,343

QUICK-RELEASE TOOL CHUCK

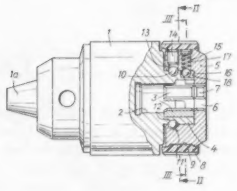
Karl Wanner, Echterdingen; Reinhard Hähner, Kemnat; Wolfgang Schmid, Plattenhardt; Gernot Hänsel, Stuttgart-Plieningen; Manfred Bleicher, Leinfelden, and Jorg Falchle, Bempflingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 21, 1973, Ser. No. 399,723

Claims priority, application Germany, Oct. 7, 1972, 2249234

Int. Cl.² B23B *31/04*

U.S. Cl. 279—1 B **9 Claims**



1. A quick-release tool chuck, comprising a chuck body including jaw means for engaging a tool and having a passage provided with a profiled cross-section having circumferentially spaced profiled portions extending inwardly of said passage, and with an open end; a drive shaft having an end portion which is receivable in said passage and provided adjacent to the profiled end portion with a circumferential recess the inner diameter of which is greater than the smallest diameter of said profiled cross-section; and arresting means, including a ring mounted on said chuck body for turning movement between two end positions, retaining means for retaining said ring in said respective end positions thereof, the claw portions displaceable circumferentially of said passage between a release position in which they are each located in axial alignment with one of said profiled portions, and an arresting position in which they are each located between two circumferentially adjacent ones of said profiled portions, so as to arrest said drive shaft against axial movement relative to said chuck body; and detent means for detaining said ring against movement relative to said body in axial direction of said passage, said detent means having an outer circumferential groove provided in a surface of said body which is surrounded by said ring, an inner circumferential groove provided in an inner surface of said ring and registering with said outer groove, and a plurality of ball members each received partly in said inner groove and partly in said outer groove.

3,929,344

MOUNT FOR PAIR OF SKI BOOTS ON SINGLE SNOW SKI

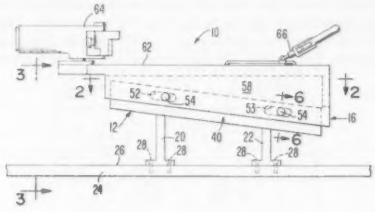
Joseph D. Ott, 3220 Homestead Road, Santa Clara, Calif. 95051

Filed Feb. 28, 1975, Ser. No. 554,348

Int. Cl.² A63C *5/00*

U.S. Cl. 280—11.35 C **12 Claims**

1. A mount for a pair of ski boots for a single ski comprising: a base having a pair of spaced, side-by-side sections; means on the base for mounting the same on a ski with the sections extending longitudinally of the ski; a boot mounting member for each section, respectively, each mounting member having an upper, boot-receiving surface provided with binding means thereon so that a ski boot can be releasably connected thereto; means mounting each member, respectively, on the corresponding section for movement longitudinally thereof through



a limited distance; and a link pivotally connected to the members and pivotally coupled to the base intermediate its ends to permit one of the members to move in one direction as the other member moves in the opposite direction relative to the base.

3,929,345

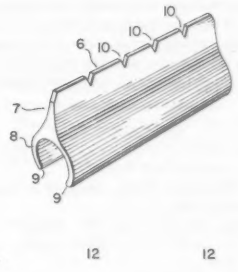
SKI BOOT CLEANER

Robert D. Nasby, 6912 Edwina, NE., Albuquerque, N. Mex. 87110, and James A. Corll, 1911 Spruce St., Los Alamos, N. Mex. 87544

Filed May 23, 1974, Ser. No. 472,604

Int. Cl.² A63C *11/22*

U.S. Cl. 280—11.37 E **10 Claims**

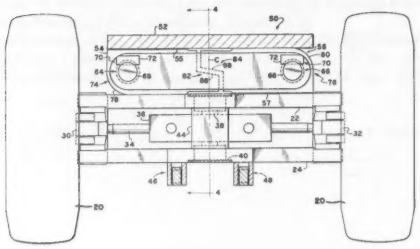


1. A ski boot cleaner comprising at least one elongated scraping member and a securing means to rigidly secure said scraping member to the shaft of a ski pole intermediate the handle and snow pad of said ski pole wherein said elongated scraping member is a flange extending radially outwardly from said securing means with said flange affixed to said securing means along the base of said flange and terminating at an outer edge and being substantially parallel to the axis of said shaft and wherein said securing means is an elongated channel formed by a housing having substantially cylindrical interior walls to cooperate with said shaft and substantially cylindrical outer walls, said housing having a slot therein extending in the same direction as the axis of said cylindrical interior walls thereby forming a pair of inwardly facing oppositely disposed resilient lips defined by said slot so that movement away from said shaft of said ski pole is resisted by the cooperation of said lips and said shaft.

3,929,346
STEERING AXLE ASSEMBLY PROVIDING IMPROVED LATERAL STABILITY

Derek K. Keene, Philadelphia, and James A. Wahl, Langhorne, both of Pa., assignors to Eaton Corporation, Ohio

Filed Apr. 17, 1974, Ser. No. 461,569
Int. Cl.² B60P *1/02*
U.S. Cl. 280—87 R **13 Claims**



10. In a load lifting vehicle including an elevatable load carriage, a pair of ground-engaging wheels, a vertical central plane and a vehicle frame portion extending transversely of the vehicle, a steering axle assembly connecting the wheels, comprising:

a. a main frame, oppositely disposed from the vehicle frame portion;

b. a first support frame fixedly attached to the vehicle frame portion and carrying a first pivot means;

c. a second support frame fixedly attached to said main frame and carrying a second pivot means, said first and second pivot means being oppositely disposed about said central plane;

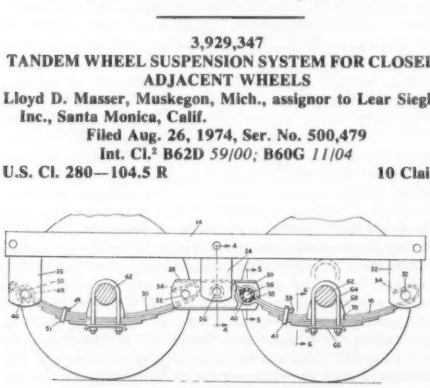
d. link means connecting said first and second pivot means and maintaining said first and second pivot means on a substantially constant center-to-center distance; and

e. said first support frame is normally in contact with said main frame and said second support frame is normally in contact with the vehicle frame portion to permit angular movement of said main frame, with respect to the vehicle frame portion, about either of said pivot means.

3,929,347
TANDEM WHEEL SUSPENSION SYSTEM FOR CLOSELY ADJACENT WHEELS

Lloyd D. Masser, Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 26, 1974, Ser. No. 500,479
Int. Cl.² B62D *59/00;* **B60G** *11/04*
U.S. Cl. 280—104.5 R **10 Claims**



1. In a suspension system for a vehicle including tandem pairs of closely adjacent ground engaging wheel wherein at least first and second leaf springs are positioned between the wheels, means support said leaf springs in tandem beneath said vehicle and means support axles for said ground engaging wheels on said leaf springs, the improvement in said leaf spring support means comprising:

first, second, and third U-shaped hanger brackets mounted in spaced relationship in inverted manner to the underside of the frame of said vehicle;

a pair of rigid identical facing equalizer brackets pivotably mounted to said second U-shaped hanger bracket;

means pivotably mounting said first leaf spring to said first U-shaped hanger bracket on one end and said equalizer bracket at another end;

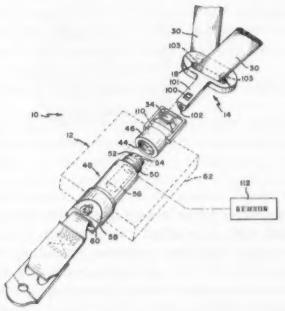
means for pivotably mounting said second leaf spring to said equalizer bracket at one end and to said third U-shaped bracket at the other end; and

said first, second, and third U-shaped brackets and said equalizer brackets being formed by bending identical blanks of sheet metal, such that said brackets have an identical configuration in unbent sheet form.

3,929,348
TONGUE FOR INFLATABAND

Ronald C. Lawwill, Birmingham, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 442,022
Int. Cl.² B60R *21/08*
U.S. Cl. 280—150 AB **1 Claim**



1. A seat band restraint assembly comprising a hollow tongue, a buckle portion, with a push button mounted on one side thereof, adapted to be latched with said tongue and unlatched therefrom on actuation of the push button, an inflatable seat band restraint mounted on said tongue, said buckle portion being provided with chamber means, said tongue having a single central passageway having a longitudinal axis through a portion thereof, said buckle portion containing a latching bar mounted therein moving perpendicular to the longitudinal axis of the passageway, said tongue containing a recess therein for receipt of the bar and consequent latching of said tongue to said buckle at one end of said tongue as a result of reception of the bar in said recess, said recess located on the same side of the tongue as said push button mounting on the buckle, said central passageway being located at the end of said hollow tongue adjacent said recess, exit ports in said hollow tongue in communication with said central passageway and said inflatable band for communicating gas from said passageway to said band, said exit ports located at the end of said hollow tongue opposite to the end latched to the buckle, said central passageway being adapted to communicate with said chamber means when said tongue and buckle portions are latched, inflating means communicating with said chamber means, said inflating means including a gas source whereby said inflating means and said inflatable band are interconnected through said chamber means, said central passageway and said ports when said hollow tongue and said buckle portion are latched so as to allow gas released from said gas source to inflate said inflatable seat band restraint, said inflatable band restraint being mounted on said tongue

between said exit ports and the end of the central passageway adjacent said recess.

3,929,349

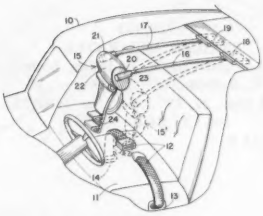
PROTECTIVE DEVICE FOR VEHICLES

Emil Georg Schubert, 4210 Kenyon Ave., Los Angeles, Calif. 90066

Filed Sept. 30, 1974, Ser. No. 510,482

Int. Cl.² B60R *21/02*

U.S. Cl. 280—150 B **4 Claims**



1. A protective device for protecting an occupant of a vehicle equipped with a seat and seat belt, comprising, in combination:

a. elongated resilient means secured to said vehicle and extending forwardly in a generally horizontal direction above the vehicle seat in a cantilevered fashion;

b. a head cushion secured to the forward portion of the resilient means;

c. a chest cushion secured to the underside of said head cushion; and

d. first and second channels at different distances below said chest cushion secured to the underside of said chest cushion, either one of which may receive said seat belt, said resilient means supporting said head cushion and chest cushion when not in use being in a position in front of an occupant in said vehicle seat blocking his line of vision out the front of the vehicle, whereby the occupant can pull down on said protective device against the bias of said resilient means towards his front when seated and pass the seat belt through one of said channels and then fasten the same to thereby anchor said protective device in a proper protective position in front of him below his line of sight out the front of the vehicle, releasing of said seat belt permitting said protective device to be raised by said resilient means to a position blocking the occupant's line of sight from the front of the vehicle so that in order to see effectively to operate the vehicle a driver occupant must lower the protective device and anchor the same with said seat belt in its protective position, one or the other of said channels being selected for securement by said seat belt to provide an adjustment of the vertical height of said protective device in accord with the size of the vehicle occupant.

3,929,350

SAFETY DEVICE WITH AN INFLATABLE CUSHION, ESPECIALLY FOR AUTOMOBILES

Bernard M. Pech, Paris, France, assignor to Societe Nationale des Poudres et Explosifs, France

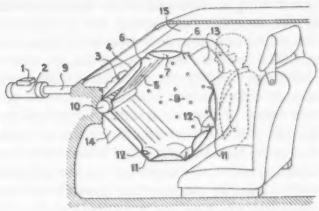
Filed Jan. 15, 1973, Ser. No. 323,954

Claims priority, application France, Jan. 19, 1972, 72.01803

Int. Cl.² B60R *21/08*

U.S. Cl. 280—150 AB **14 Claims**

1. A safety device for moving vehicles, especially for automobiles, comprising a collision detector controlling the actuation of a source of gas under pressure, at least one inflatable safety cushion connected to said source of gas, said cushion comprising an inner chamber communicating with the atmosphere via orifices with valves which open only in the direction which admits air into the said chamber, and an outer chamber connected to the said source of gas under pressure and enclosing partially the inner chamber, the walls of these two chambers being arranged one inside the other and being firmly fixed to one another in a discontinuous manner, the inner wall being made of elastic material, the outer wall being made of flexible material, said chambers being adjacent and non-communicating, the outer chamber spreading out the cushion when it is pressurized, and the inner chamber being spread out by the pressurization of the outer chamber and being pressurized



itself by sucking in air from the atmosphere via the inlet orifices, elastic means compressing the outer chamber, said elastic means comprising at least said inner wall, said valves having a calibration pressure less than atmospheric, whereby the pressure of the inner chamber is maintained substantially less than the pressure of the outer chamber and less than atmospheric pressure during the cushion compression phase and during the entire stage of deadening of the blow, for deadening the blow to the person to be protected, the region of the cushion coming in contact with the head of said person being a portion of one of said walls which bounds the inner chamber, whereby the head is subjected to the lower pressure of said inner chamber.

3,929,351

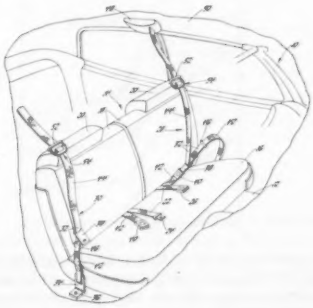
COMFORT CLIP FOR A SHOULDER BELT OF A VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

John J. Fricko, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,455

Int. Cl.² B62B *35/00*; **B60R** *21/10*

U.S. Cl. 280—150 SB **1 Claim**



1. In a vehicle occupant restraint belt system including lap and shoulder belts having a predetermined width between side edges thereof, a buckle assembly for securing the lap and shoulder belts across a seated vehicle occupant, a shoulder belt guide slidably receiving and thereby guiding the shoulder belt over the shoulder of the seated occupant, and a shoulder

belt retractor receiving the shoulder belt so as to normally pull the shoulder belt back through the guide for storage but permitting withdrawal thereof for use, a comfort clip for the shoulder belt comprising:

an integral plastic clip of a generally S-shaped configuration that defines elongated slots opening outwardly in opposite directions, the clip including a central belt web between the slots and a pair of legs extending from the belt web in opposite directions to cooperate therewith in defining the slots, the clip web and legs being located in the same plane so that the shoulder belt takes an abruptly curved configuration upon being passed through the slots and over the web, this abruptly curved configuration of the belt generating a frictional force that positions the clip along the shoulder belt during use so that the clip engages the guide to prevent the retractor from tensioning the shoulder belt across the occupant, the slots each having a bifurcated configuration adjacent the open end thereof so as to define two tine portions, one tine portion of each slot being in alignment with the rest of the slot and being closed at its outer end, the other tine portion of each slot being laterally displaced from the rest of the slot and opening outwardly to permit the shoulder belt to be received by the clip intermediate ends of this belt by inserting opposite edges thereof into the slots, the clip leg adjacent each slot including an integral projection that extends inwardly at the open end of the associated slot between the tine portions thereof so as to terminate at an inward end in a manner that defines the bifurcated configuration of the open end of the slot, and the opposite edges of the belt being passed over the inward ends of the respective projections after insertion into the laterally displaced open tine portions of the slots so as to be received within the closed tine portions and the rest of the slots in a manner that retains the clip on the belt, the clip web and the integral projections thereof being recessed from at least one outer side of the comfort clip to recess the abruptly curved configuration portion of the belt within the confines of the comfort clip.

3,929,352

SPLASH GUARD

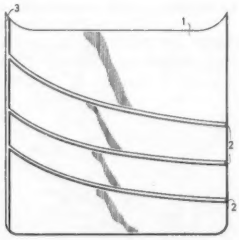
Knut Arenhold, Birkenweg 5, 764 Kehl, Germany

Filed Aug. 19, 1974, Ser. No. 498,274

Claims priority, application Germany, June 18, 1974, 2429467; Aug. 22, 1973, 7330563[U]

Int. Cl.² B62D *25/16*

U.S. Cl. 280—154.5 R **3 Claims**



1. A splash guard for a vehicle wheel comprising:

a sheet of material having a top edge, a bottom edge, and two laterally spaced side edges, the sheet being adapted for mounting adjacent its top edge on a vehicle behind a wheel of the vehicle so that one face of the sheet is presented to the wheel;

at least one continuous transverse rib projecting from said one face of the sheet and extending from one side edge of the sheet to the other side edge of the sheet, the transverse rib being curved along its length and inclined so that it is closer to the top edge of the sheet at the outermost side edge of the sheet, relative to the vehicle, than it is at the innermost side edge, the curvature of the transverse rib being larger adjacent the outermost side edge of the sheet than adjacent the innermost side edge so that the end of the transverse rib adjacent the innermost side edge of the sheet is more nearly horizontal, relative to the vehicle, than the end adjacent the outermost edge; and

a longitudinal rib connected to the transverse rib and projecting from said one face of the sheet and extending along the outermost side edge of the sheet.

3,929,353

TRAILER APPARATUS

Cuba L. Burleson, and Charles B. Dillon, both of Box 157, Highway 36, S., Bellville, Tex. 77418

Filed Mar. 22, 1973, Ser. No. 343,829

Int. Cl.² B62D *53/06*

U.S. Cl. 280—423 R **8 Claims**

1. A trailer apparatus adapted for connection with a towing vehicle to effect desired movement of a cargo or load positioned on the trailer apparatus, including:

a. an axle housing rotatably mounting a pair of spaced wheels for supporting said axle housing;

b. a support frame mounted with said axle housing for supporting the load on said axle housing;

c. a drawbar assembly connected with said support frame including:

1. a first substantially vertical member having a first lower end connected with said support frame; and

2. a second substantially vertical member laterally spaced from said first substantially vertical member with each of said vertical members having a first lower end connected with said support frame;

3. a first gooseneck forming member having a substantially horizontal first position connected with said substantially vertical member at a location spaced from the connection of said substantially vertical member with said frame and extending from said substantially vertical member to a second portion of said gooseneck forming member which angles downwardly from said substantially horizontal first portion at an angle greater than 30° and less than 40° to said hitch means;

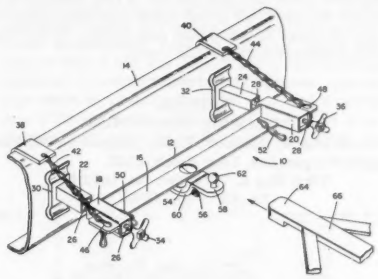
4. a second gooseneck forming member laterally spaced from said first gooseneck forming member and having a substantially horizontal first portion connected with said second substantially vertical member at a location spaced from the connection with said support frame and extending from said second substantially vertical member to a second portion of said second gooseneck forming member which angles downwardly from said substantially horizontal first portion of said second gooseneck forming member at an angle greater than 30° and less than 40° to said hitch means whereby operator visibility, usable cargo space, and overall length is enhanced; and

d. hitch means mounted on said drawbar assembly at a location spaced from said support frame for releasably connecting said drawbar with the towing vehicle wherein towing force is imparted to said trailer apparatus for effecting movement thereof.

3,929,354
ADJUSTABLE DRAWBAR

Edward John Elkins, 3568 Halifax Way, Concord, Calif. 94520

Filed Dec. 19, 1974, Ser. No. 534,320
Int. Cl.² B60D 1/06
U.S. Cl. 280—490 R 6 Claims



1. A trailer hitch comprising:

a hitch frame attachable to a towing vehicle and including an exposed arcuate mounting surface having at least one aperture formed therethrough;

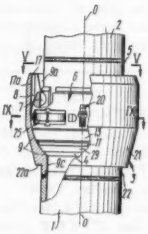
a drawbar having an arcuate portion and a linear trailer mounting portion contiguous to the arcuate portion, said arcuate portion having an inner arcuate surface conformed to the exposed arcuate mounting surface of the hitch frame and adapted to partially circumscribe said mounting surface, and at least one circumferential slot through said arcuate portion; and

means for mounting the arcuate portion of the drawbar to the mounting surface of the hitch frame, said mounting means including at least one fastener extending through the aperture in the mounting surface and the slot in the arcuate portion of the drawbar, said fastener being loosened for adjusting the circumferential position of the arcuate portion of the drawbar with respect to the mounting surface so that the trailer mounting portion of the drawbar can be made horizontal and tightened to fix the drawbar in position so that the likelihood of damage to the trailer hitch or the towing vehicle due to misalignment of the drawbar is minimized.

3,929,355
PIVOTAL PIPE JOINT

Anatoly Emelyanovich Sljusar, ulitsa B. Khmelnitskogo, 84, kv. 5, Belgorod, U.S.S.R.

Filed Apr. 4, 1974, Ser. No. 457,758
Int. Cl.² F16L 35/00
U.S. Cl. 285—39 19 Claims

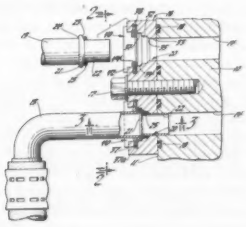


1. A pivotal pipe joint comprising: a female member secured to the end of one of a pair of pipes to be connected; a spherical socket in said female member, coaxial with said one pipe; a spherical ring receivable in said spherical socket of said female member and having an external spherical surface congruent with said surface of said socket and an internal cylindrical surface defining the bore of said ring; grooves made in said spherical ring; a bore made in said female member extending coaxially with said spherical socket and having two diametrically opposite longitudinal grooves on its surface through which said spherical ring is adapted to be inserted into said spherical socket and remove therefrom; a male member having one end secured to the end of the other pipe of said pair, said male member being receivable upon connection of said pipes in said bore of said spherical ring coaxially therewith, the external cylindrical surface of said male member being complementary to said cylindrical surface of said bore of said spherical ring, the opposite free end of said male member being receivable in said socket of said female member; retaining means securing said spherical ring in said socket of said female member coaxially therewith at an initial stage of connection of said pipes, said retaining means including at least two spring-urged retaining members each respectively positionable in ports formed in said spherical ring, said ports being located intermediate the grooves in said spherical ring, said retaining means being cooperable with recesses formed in the spherical surface of said socket so as to lock said spherical ring in said socket; said retaining means being cooperable with the male member so as to disjoin said spherical ring and said female member at a final stage of connection of said pipes; grooves made in said external surface of said male member and positioned at the final stage of connection of said pipes to face said grooves in said spherical ring so that their respective edges are aligned; spring-urged locking means effecting connection of said male member and said spherical ring upon said male member having been received in said bore of said spherical ring, with said locking means being accommodated simultaneously in said grooves of said spherical ring and said grooves of said male member; sealing means for sealing away the surfaces of said socket of said female member and said male member.

3,929,356
TUBE TO BLOCK MOUNTING ASSEMBLY

Patsy DeVincent, Dayton; John A. Falkowski, Tipp City, and John F. Wiechart, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1974, Ser. No. 523,433
Int. Cl.² F16L 35/00
U.S. Cl. 285—305 3 Claims



1. A tube mounting assembly comprising a body member having a cylindrical stepped bore extending from one surface thereof and defining a socket, said body member having a slot opening extending transversely from one side thereof and intersecting said stepped bore at right angle thereto closely adjacent to said one surface, a tubular member having a plug portion at one end thereof which is slidably received in said socket and in sealing relation to said socket when fully inserted therein, said plug portion including an annular bead on the exterior of said tubular member providing a radial shoulder and, a retainer clip means having a body portion with a

longitudinal extending through slot opening therein defined by a first semi-circular rim edge at one end of a diameter to slidably receive said annular bead, a second semi-circular rim edge at the opposite end and by interconnecting spaced apart rim edges, said rim edges providing a first shoulder means and a second shoulder means in parallel spaced apart relation to each other and longitudinally spaced apart on said body portion, said retainer clip means being slidably received in said slot, whereby said retainer clip means is movable from a position in which said first shoulder means engages said shoulder of said bead when said plug portion is fully inserted into said socket to retain said plug portion fully engaged and sealed, a second position at which said second shoulder means engages said shoulder to retain said plug portion within said socket in a position out of sealing engagement therewith and a third position at which said first semi-circular rim edge is concentric with said stepped bore to permit removal of said plug portion from said body.

3,929,357

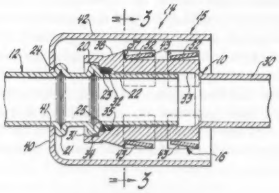
QUICK CONNECT COUPLING WITH TANDEM SNAP RINGS

Patsy DeVincent, and John F. Wiechart, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1974, Ser. No. 523,432

Int. Cl.² F16L *39/00*

U.S. Cl. 285—319 **3 Claims**



1. A conduit coupling comprising a tubular socket member having a stepped bore therethrough and defining at one end thereof a socket and having an annular flange on the exterior thereof providing a ramped forward surface adjacent to said one end which terminates at a shoulder extending radially inward, a tubular plug member having a plug portion at one end thereof slidably received in said socket and in sealing relation to said socket when fully inserted therein, said plug member including a tube having annular bead means on the exterior thereof defining a first shoulder and an axially spaced apart, opposed second shoulder, said first shoulder having a cylindrical pilot portion extending therefrom to the free end of said tubular plug member, and a seal ring encircling said pilot portion, a portion of said annular bead means including said first shoulder, said pilot portion and said seal ring defining said plug portion, said stepped bore being defined by a first annular wall extending from said one end and of a diameter to slidably receive said annular bead means defining said first shoulder, a second annular wall of reduced diameter with an intervening radial shoulder therebetween and a third annular wall of a diameter to slidably receive said pilot portion of said plug member with an intervening second radial shoulder therebetween, the axial extent of said third annular wall being greater than the axial extent of said pilot portion, whereby when said plug member is fully inserted into said socket, said first shoulder is in abutment with said radial shoulder, said first shoulder and said pilot portion forming with said second annular wall and said second radial shoulder a substantially enclosed annular cavity of a predetermined axial width and radial width in which said seal ring is compressibly received when said plug member is fully inserted into said socket member, and an outer retainer means, said outer retainer means including an apertured cup member operatively connected to said tubular plug member and having an annular rim extending over and encircling said plug portion, said rim having diametrically opposed axially spaced apart openings therethrough and a unitary tandem snap ring having a mounting base fixed to the exterior of said cup and having axial spaced apart pairs of spring legs extending therefrom through said openings, one pair of said spring legs being engageable with said shoulder when said plug portion is fully inserted in said socket and the other pair of said spring legs being engageable with said shoulder to retain said plug portion within but in nonsealing engagement with said socket.

3,929,358

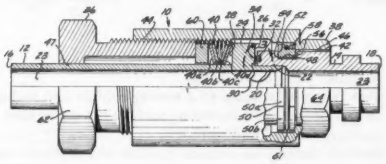
CRYOGENIC CONNECTOR

Fred A. Eckhardt, Anaheim, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 1, 1974, Ser. No. 466,011

Int. Cl.² F16L *19/00*

U.S. Cl. 285—353 **9 Claims**



1. A connector for fluid lines containing cryogenic materials, the connector including:

a first tubing extension defining a passageway therethrough for containing the cryogenic material, said first tubing extension including an outwardly extending radial sealing surface and an abutment surface;

a second tubing extension defining a passageway therethrough for containing the cryogenic material, said second tubing extension including an outwardly extending radial sealing surface positioned to face said outwardly extending radial sealing surface of said first tubing extension and an abutment surface;

seal means positioned between said outwardly extending radial sealing surfaces of said first and second tubing extensions and about said defined cryogenic material containing passageway; and

means to apply a predetermined force across said first and second tubing extension members to compress said seal means therebetween to establish and maintain a sealed condition thereof said force applying means including a gland extending over a portion of one of said tubing extensions, a thimble extending over a portion of the other of said tubing extensions, abutting said abutment surface thereof and threadably engaging said gland, and spring means positioned about said tubing extension over the portion of which said gland extends and engaging said abutment surface thereof, said spring means also engaging said gland and being compressed when said gland and thimble are threadably engaged.

3,929,359

CONNECTING JOINT STRUCTURE FOR CORRUGATED PLASTIC TUBING

John D. Schmunk; James L. Child, Jr.; Robert E. Shroy, and John Wise, all of Findlay, Ohio, assignors to Hancock Brick and Tile Company, Findlay, Ohio

Filed Nov. 4, 1974, Ser. No. 520,458

Int. Cl.² F16L *21/00*

U.S. Cl. 285—401 **8 Claims**

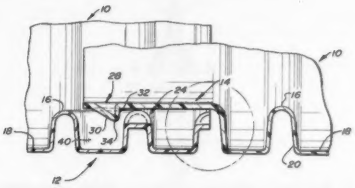
1. A joint construction for plastic pipe comprising:

a first main length of corrugated, hollow and generally cylindrical plastic pipe having an internal wall surface

defined by adjacent circumferentially extending, longitudinally spaced peaks and valleys;

the internal diameter of said first length measured diametrically between opposite peaks being equal to *d*, and the internal diameter measured diametrically between opposite valleys being equal to D, with D being substantially greater than *d*;

said first length including a first portion which defines an end of said length and having an internal diameter *j* measured diametrically between opposed peaks which is greater than d but less than D, and a maximum internal diameter measured diametrically between opposed valleys which is substantially equal to D, and a plurality of sets of longitudinally aligned grooves formed in at least the two peaks adjacent the outer end of said first portion;



a second main length of hollow plastic pipe having a generally cylindrical corrugated portion and a smooth-walled cylindrical second portion which defines an end of said second length and has an outer diameter which is slightly less than *j* but greater than d and an inner diameter J which is substantially equal to *d*; and,

cleat members extending outwardly from the outer surface of said second portion of said second length, said cleats having a configuration and location to permit them to move longitudinally into the aligned grooves in the first portion of said first length, the portion of said second length being received in said first portion of said first length with the cleats of said second portion of said second length being located in valleys of the first portion of said first length and in a non-aligned position relative to said grooves.

3,929,360

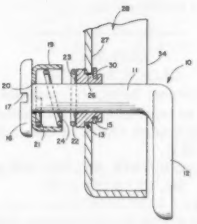
CABINET LATCH

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corporation, Los Angeles, Calif.

Continuation of Ser. No. 409,152, Oct. 24, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,070

Int. Cl.² E05C *5/00*

U.S. Cl. 292—67 **2 Claims**



1. In combination with a door having a panel, said panel having an opening therethrough, a latch device for said door comprising

a collar having

an intermediate portion received in said opening,

a flange exteriorly of said opening at one end thereof overlapping and engaging one side of said panel,

an annular groove exteriorly of said opening at the opposite end thereof, and an aperture extending axially therethrough,

a snap ring having an inner portion received in said groove and an outer portion projecting beyond said groove for engaging the opposite side of said panel and cooperating with said flange in holding said collar to said panel,

a one-piece substantially L-shaped member having

a first portion extending through said aperture and a second portion at an angle to said first portion and positioned outwardly from said opposite side of said panel,

said first portion of said substantially L-shaped member being cylindrical and being substantially complementarily received in said aperture, so that said collar at said aperture guides said first portion for axial and rotational movement relative to said collar,

a head projecting laterally outwardly from the end of said first portion opposite from said second portion for providing a means for imparting rotation to said L-shaped member,

said head having an undersurface facing said panel,

a cup-shaped member having an inner transverse wall having an opening receiving said first portion and in juxtaposition with said undersurface of said head, said head being entirely exteriorly of said cup-shaped member and beyond said inner transverse wall thereof, and a compression spring one end of which engages said inner wall of said cup-shaped member and the opposite end of which engages the outer surface of said flange of said collar,

for thereby biasing said cup-shaped member, said head and said L-shaped member to a first position where said head is spaced outwardly from said one side of said panel and said cup-shaped member is spaced outwardly from said flange of said collar with a portion of said compression spring being exposed between said cup-shaped member and said flange of said collar,

said substantially L-shaped member, head and cup-shaped member being movable in opposition to said spring to a second position in which said head is relatively closer to said one side of said panel,

said cup-shaped member having a larger lateral dimension than that of said flange of said collar,

whereby when said cup-shaped member is in said second position said flange of said collar is received in said cup-shaped member and said compression spring is concealed.

3,929,361

LOCK MECHANISM FOR A VEHICLE DOOR

Horst Klebba, Weyhausen, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Aug. 1, 1974, Ser. No. 493,926

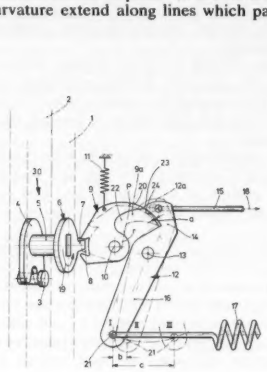
Claims priority, application Germany, Aug. 17, 1973, 2341641

Int. Cl.² E05C *3/26*

U.S. Cl. 292—216 **5 Claims**

1. An improved rotary-latch lock, preferably for the door of a vehicle, having a rotary locking assembly, a pivotally supported intermediate lever that meshes with said locking assembly, a pivotally supported main actuating lever, and a main spring connected to one end of said main lever for urging the other end of said main lever into contact with said intermediate lever, said intermediate lever being rotatable in a direction to open the lock and in a direction to close the lock, said main spring forcing said main lever against a first surface of sid intermediate lever during the opening of said lock, wherein the improvement comprises means tending to rotate the intermediate lever in the opening direction, said means including a curvature of said first surface of said intermediate lever such

that contact between said intermediate and main levers along said first surface occurs at points of said first surface whose radii of curvature extend along lines which pass the pivotal



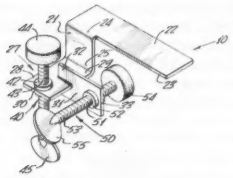
support of said intermediate lever on a side thereof such that the force applied to said intermediate lever by said main lever due to said main spring tends to rotate said intermediate lever in the opening direction.

3,929,362

LOCK FOR SLIDING DOORS AND WINDOWS

Guy Petroff, Fullerton, Calif., assignor to Philip M. Hinderstein, Orange, Calif.

Filed Sept. 26, 1974, Ser. No. 509,546
Int. Cl.² E05C *19/18*
U.S. Cl. 292—291 **8 Claims**



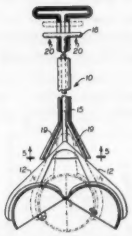
1. A lock for sliding doors and windows comprising:
a wall;
a first flange, one edge of said first flange being connected to one end of said wall and extending perpendicular thereto;
a second flange, one edge of said second flange being connected to the other end of said wall and extending perpendicular thereto, on the opposite side thereof as said first flange;
a third flange being connected to said second flange, said third flange being positioned parallel to said wall and being spaced therefrom on the same side thereof as said second flange;
a first adjustable bolt member extending through said second flange, perpendicular thereto; and
a second adjustable bolt member extending through said third flange, perpendicular thereto.

3,929,363

PORTABLE COLLECTOR APPARATUS WITH RESILIENT TONGS

Edward Kahan, 8 Alderwood Lane, Syosset, N.Y. 11791

Continuation-in-part of Ser. No. 154,471, June 18, 1971, Pat. No. 3,738,697. This application May 31, 1973, Ser. No. 365,483. The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.
Int. Cl.² A47F *13/06*
U.S. Cl. 294—19 R **1 Claim**



1. A portable collector apparatus which comprises an extended hollow handle, said handle having a camming end and a holding end, a pair of resilient tongs supported in said camming end, said tongs being disposed for angular movement relative to each other between a maximum spaced position and a minimum spaced position, said tongs being in a maximum spaced position when unconstrained, and means at said camming end to constrain said tongs to a minimum spaced position when said tongs are retracted into said camming end of said handle, rod means integrally associated with said tongs within said hollow handle and accessible at said holding end thereof for retracting said tongs at least partially into said handle for movement to a minimum spaced position and for projecting said tongs out of said handle for movement into a maximum spaced position, a container having sections connected by a resilient hinge, said hinge biasing said sections into an open maximum spaced-apart position, and said container being movable by and with said tongs from an opened configuration to a closed configuration for receiving and completely enclosing matter to be collected; said hollow handle having two similar longitudinal sections press-fitted together around said rod means, and having means defining cam surfaces disposed for engagement with said tongs to forcibly move same toward said minimum spaced position when the rod means is moved toward said holding end, said tongs and container sections having corresponding matching parts that engage to secure the container in a predetermined position relative to the tongs, said container sections having respective parts disposed for locking engagement, when the tongs are in said minimum spaced position, to secure the container in the completely enclosed configuration.

3,929,364

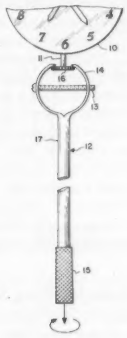
CLOCK SETTER

Claude T. Haley, Newport News, Va., assignor to The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Sept. 9, 1974, Ser. No. 504,225
Int. Cl.² B25J *1/00*
U.S. Cl. 294—19 R **1 Claim**

1. A clock setter for manually twisting the serated reset knob of a wall-mounted clock and thus enabling an operator to adjust the indicated time of the clock, comprising in combination:
a rod means having two ends; said rod means being capable of extending from an operator's reach to the serated reset knob of a wall-mounted clock;

a cap means having two adjustably opposed members extending axially outward from one end of said rod means and having lower, middle and upper portions; said members being joined together at said lower portions and said middle and upper portions being in spaced relation; said middle portions being spaced such that the serated reset knob will pass between said middle portions; said upper portions being disposed toward each other and spaced such that the serated reset knob will not pass between said upper portions; said upper portions having tips which



engage the serations of the reset knob when a downward force is exerted on said rod means thereby permitting a twisting motion to be imparted to the reset knob;

an adjusting means disposed between said opposed members for adjusting the spacing between said upper and middle portions to accomodate serated reset knobs of varying diameters; and

a handle means attached to the end of said rod means opposite said cap means for receiving and transmitting to said rod means a downward and twisting force.

3,929,365

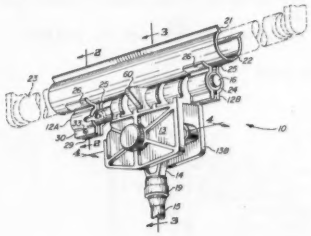
FLUORESCENT TUBE CHANGING DEVICE

Joe B. Hunt, and Nina E. Hunt, both of 3601 E. Orange Drive, Phoenix, Ariz. 85018

Filed Aug. 16, 1974, Ser. No. 497,877

Int. Cl.² H01K 3/32

U.S. Cl. 294—21 **2 Claims**



1. A device for changing fluorescent tubes and the like comprising:

a generally semi-cylindrical head having interior surface means of the same size as the exterior periphery of a fluorescent tube arranged to be engaged therewith in response to transverse movement of said head toward the tube,

said interior surface means having a tacky resinous material thereon capable of sticking to the exterior periphery of the tube when contacted therewith so as to prevent sliding movement of said interior surface means with respect to the exterior periphery of the tube but to permit ready disengagement of said interior surface means from the exterior periphery of the tube in response to transverse movement of said head away from the tube,

and elongated handle connected with said head for effecting transverse movement of said head into engagement with the exterior periphery of a tube to be changed and a subsequent movement of said head with the tube engaged therewith to release the latter from its fixture and for effecting movement of a replacement tube engaged with said head into securement with the fixture and subsequent transverse movement out of engagement with the secured tube in the fixture,

said elongated handle being connected with said head by means providing for a limited pivotal movement between said elongated handle and said head about a first axis parallel with the axis of said head and spaced closely to the periphery thereof to facilitate a partial rotational movement of said head about its axis when in engagement with a fluorescent tube of the type which is engaged and released from its fixture by a partial rotational movement of the tube with respect to its fixture,

said limited pivotal means comprising a pair of spaced cylindrical members fixedly secured to the center peripheral portion of said head,

a shaft means rotatably mounted within said cylindrical member and having an arm extending radially outwardly therefrom,

said shaft means being fixedly attached to said handle for rotation therewith,

said handle and said shaft means being movable arcuately a predetermined distance about said pair of cylindrical members until said arm engages the outer periphery of said head at which time partial rotational movement of said head about its axis occurs when in engagement with the fluorescent tube to release it from its fixture,

said limited pivotal means further comprising a pair of parallelly arranged juxtapositioned spaced surfaces connected along a common end to said shaft means,

stop means fixed to said handle and said handle being pivotally mounted between said spaced surfaces,

said stop means engaging said limited pivotal means upon rotation of said handle about the pivotal connection of said handle to said spaced surface, and

means for applying frictional force to said handle to control the ease of rotation of said handle between said spaced surfaces.

3,929,366

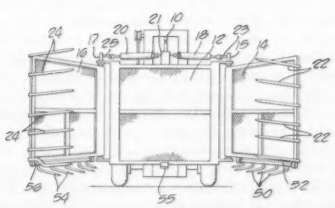
COTTON LOADER

John J. Keverline, 11242 G & S Ave., Hanford, Calif. 93277

Filed Aug. 21, 1974, Ser. No. 499,124

Int. Cl.² B66F 9/20

U.S. Cl. 294—88 **6 Claims**



1. A loading attachment for an industrial lift truck, or the like, comprising: a rear wall; a pair of side walls hinged to the side edges of the rear wall to be turned about respective vertical pivotal axes between an open and a closed position; a first and second series of elongated fork members mounted in

essentially spaced and parallel relationship along the respective forward end edges of the side walls in essentially perpendicular relationship to the planes of the respective side walls, said fork members serving to form a front wall for the attachment when the side walls are in their closed position essentially parallel to one another and perpendicular to the rear wall; and means coupled to the side walls to move the side walls to their open position in which the side walls are turned away from one another about said vertical axes, and to move the side walls to their closed position in which the side walls are turned towards one another to cause the elongated fork members of the first and second series to separate the load, and to cause the side walls to squeeze against the load.

3,929,367

MEANS FOR LOCKING A GRIPPING MEMBER OF A PAIR OF GRIPPING TONGS AGAINST ROTATION

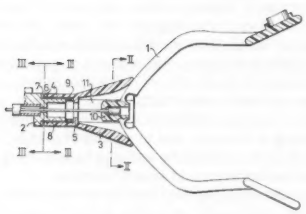
Per Olof Bjurling, and Sven-Eric Juhlin, both of Gustavsberg, Sweden, assignors to AB Gustavsbergs Fabriker, Gustavsberg, Sweden

Continuation of Ser. No. 362,777, May 22, 1973, abandoned. This application Mar. 4, 1975, Ser. No. 555,285

Claims priority, application Sweden, June 1, 1972, 7193/72

Int. Cl.² B25J *1/00;* **B25B** *3/00*

U.S. Cl. 294—99 R **2 Claims**



1. In means for locking a gripping member of a pair of gripping tongs against rotation, wherein the jaws of the tongs are moved towards each other for gripping an object by drawing the gripping member into a conical chuck by means of the operating mechanism of the tongs, a locking member (**2**) integrated with the gripping tongs being caused to engage a locking hub (**4**) that is axially displaceable by the gripping member (**1**), the improvement according to which the gripping member (**1**) and the chuck (**3**) are provided with cooperating guiding means (**10, 11**) adapted to keep the gripping member and the chuck secured against relative rotation during axial displacement into the chuck, said axially displaceable locking hub (**4**) being integrated with said chuck (**3**) and provided with coupling members (**6**) for axially engaging coupling members (**7**) of the locking member (**2**), said hub being axially displaceable on a forward projection (**8**) of said locking member (**2**) before engagement of the coupling members (**6**) and (**7**), said hub being brought into engagement with the locking member (**2**) during the initial portion of the axial displacement of the gripping member (**1**) into said chuck (**3**) whereby continued displacement of the gripping member into the chuck proceeds without any possibility of rotation in relation to the other portion of the gripping tongs.

3,929,368

DRUM LIFTERS

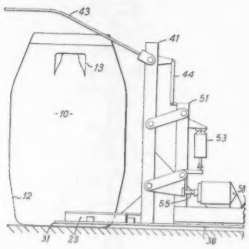
Vernon John Ryden, Ringwood, and Robert Lawford Oakley, Christchurch, both of England, assignors to St. Clare Engineering Limited, Hampshire, England

Filed May 13, 1974, Ser. No. 469,361

Claims priority, application United Kingdom, May 11, 1973, 22652/73

Int. Cl.² B66F *9/18*

U.S. Cl. 294—103 **14 Claims**



1. A drum-lifter suitable for lifting drums made of thermoplastics material having barrelled lower portions comprising a first part adapted to support a drum and having a support member for fitting against the lower portion of barrelled drum, a drum-embracing member movable relative to said support member from an inoperative position to an operative position, said drum-embracing member being adapted to engage the lower portion of the barrelled drum which is fitted against said support member and extending around the lower portion of said fitted drum, a second part adapted to be attached to a lifting means, said first and second parts being interconnected and movable relative to each other between a first unloaded position and a second loaded position, resilient means connected to bias said first and second parts towards said first, unloaded position, and actuation means arranged to move said drum-embracing member to its operative position in response to relative movement between said first and second parts from the unloaded position towards the loaded position against said resilieint bias caused by lifting said second part with a load on said first part.

3,929,369

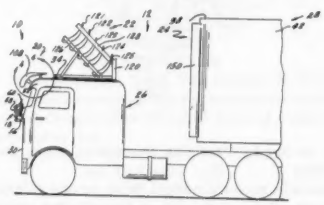
AIR DEFLECTING VANE ASSEMBLY FOR A VEHICLE

Clarence I. Blair, Wichita, Kans., assignor to Blair-Lefler, Inc., Wichita, Kans.

Filed Mar. 19, 1973, Ser. No. 342,889

Int. Cl.² B62D *37/02*

U.S. Cl. 296—1 S **11 Claims**



1. An air current deflecting means for a tractor of a tractor trailer vehicle, comprising:

a. a roof top air current deflecting means mountable on a tractor of a tractor-trailer vehicle having a support means having means to mount same above the roof of said tractor, said deflecting means having a plurality of vane mem-

bers mounted in a parallel relation on said support means,

b. said vane members each having a leading edge, a trailing edge, a forward surface and a rear surface, said forward and rear surfaces being rearwardly curved,

c. said support means having a frame securable to said vehicle roof and having a pair of vane support members pivotally mounted on said vane support means extending upward therefrom, said pair of vane support members pivotally mounting leading edge portions and trailing edge portions of said vane members with said leading edges and said trailing edges being parallel and being essentially parallel to said roof, means with said support means to move said plurality of vanes as a group in a pivoting motion above said roof,

d. a forward air current deflecting means having a forward vane mountable on a forward portion of said vehicle in a spaced relation to a forward corner portion of the roof of said vehicle and adjacent to the windshield of said vehicle, said forward vane having a leading edge, a trailing edge, a forward surface, a rear surface with said forward surface and said rear surface being generally upwardly and forwardly curved, said forward vane being constructed and adapted to turn an air current moving generally upward on said windshield so as to direct same onto said roof,

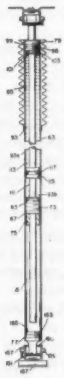
e. a nose air current deflecting means having a nose vane mount means mountable on a forward portion of the nose of said vehicle, having a nose vane support means pivotally mounted on said nose vane mount means, said nose vane mount means mounting a plurality of nose vanes in a parallel spaced relation, said nose vanes each having a leading edge, a trailing edge, a forward surface and a rear surface, said forward and rear surfaces being generally rearwardly and upwardly curved, said nose air current deflecting means being constructed and adapted to in use turn an air current moving toward said nose of said vehicle turning same to a direction upon and generally along said forward end portion of said vehicle.

3,929,370

VEHICLE-SUPPORTED STRUCTURE STABILIZER

Kenneth L. Farrell, 1719 Dundry Ave., Baldwin Park, Calif. 91706

Filed June 14, 1974, Ser. No. 479,297
Int. Cl.² B60P *3/32*
U.S. Cl. 296—23 MC **4 Claims**



1. In combination with a vehicle, a removable body structure supported on said vehicle, at least one stabilizing device extending between said structure and said vehicle for minimizing the vibration of said structure and movement of said structure relative to said vehicle when the same are in motion, said stabilizing device including:

brackets fixedly attached respectively to said structure and to said vehicle;

an inextensible elongated body member attached at a first of its ends to one of said brackets, said body member including an elongated cylindrical fluid chamber adjacent the second of said ends of said housing;

a damping fluid disposed within and completely filling said fluid chamber;

a piston supported in said fluid chamber dividing said fluid chamber into two portions of reciprocally variable capacity, said piston including at least one restricted orifice restricting the flow of said damping fluid between said two portions of said fluid chamber;

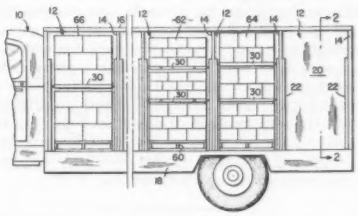
an inextensible elongated piston rod arrangement extending from opposite sides of said piston and always through said fluid-tight packing arrangements at opposite ends of said fluid chamber, a first end of said piston rod arrangement extending beyond said second end of said body member and attached to the other of said brackets and a second end of said piston rod arrangement always being disposed completely within said body member whereby relative movement of said structure and said vehicle causes a directly related reciprocal excursion of said piston in said fluid chamber, the length of said fluid chamber being substantially greater than the normal maximum reciprocal excursion of said piston, wherein each of said brackets include a body portion with attachment holes and also include a U-shaped bracket pivotally mounted on said body portion, said bracket including aligned transverse holes in the arms of said bracket, and wherein said first ends of said inextensible elongated body member and said inextensible elongated piston rod arrangement include a transverse hole and a removable pin normally disposed through associated ones of said transverse holes.

3,929,371

SUPPORT MEANS FOR STACKS OF ARTICLES

Louis J. Gibson, 1014 Anna Road, Huntingdon Valley, Pa. 19006

Filed July 1, 1974, Ser. No. 484,861
Int. Cl.² B60R *7/00*
U.S. Cl. 296—24 R **5 Claims**



1. Support means for stacks of articles to be transported in vehicles comprising means providing a plurality of bins on the transporting vehicle for receiving a stack of articles, each bin including a pair of vertically extending spaced side walls, a back wall, and a front opening through which a stack of articles is received into the bin, shelf means adapted to be placed between layers of articles in a stack to divide the stack into at least an upper and a lower portion and means for supporting a shelf means in a plurality of vertical positions within a bin including bracket means fixedly positioned to extend vertically along the side walls of a bin and having vertically spaced portions adapted to be engaged by said shelf means at various vertical locations for positioning a stack of articles within a bin in a split condition with the upper portion of the stack supported on a shelf means spaced above the lower portion of the

stack, said shelf means being removably engageable with said shelf supporting members for placement between layers of articles of a stack during the formation of the stack, said shelf means includes bracket engaging members mounted for horizontal movement between a retracted position out of engagement with said bracket means and an extended position in engagement with said bracket means for engaging said bracket means at various of said vertically spaced portions, said bracket means includes a plurality of vertically spaced openings, said openings being generally equally spaced a short distance apart throughout a vertical extent providing numerous portions at different elevations for engagement by said bracket engaging members, said bracket engaging members on said shelf means being adapted for horizontal movement into said openings, means for biasing said bracket engaging members toward said extended position thereof, and means for retaining said bracket engaging members in said retracted position thereof and movable to a position releasing the same for movement to the extended position thereof by said biasing means.

3,929,372

BABY CARRIAGE

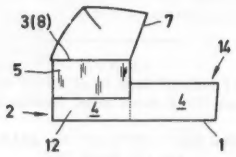
Georg Gesslein, Lichtenfels, 8621) Mannsgereuth, Kreis, Germany

Division of Ser. No. 188,846, Oct. 13, 1971, Pat. No. 3,799,606. This application Nov. 27, 1973, Ser. No. 419,394

Claims priority, application Germany, Oct. 14, 1970, 7037990[U]; July 14, 1971, 2135185

Int. Cl.² B62D *39/00*

U.S. Cl. 296—28 B **7 Claims**



1. In a baby carriage having a body adapted to be supported on a wheeled carrier having a handle, wherein said body has a bottom and head, side and foot walls defining a cradle for accommodating a baby in belly-down position with his head adjacent said head wall, the improvement wherein the wall portions at one end of said body comprise vertically, adjustably mounted wall units having lower opaque sections integrally formed with transparent upper sections, whereby the view of a baby through said transparent sections may be selectively varied, and adjustable opaque covering means for selectively covering said transparent sections.

3,929,373

INCLINING SUN CHAIR

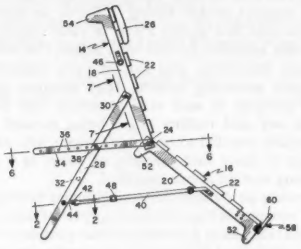
Louis S. Gawlinski, 740 Saphire St., San Diego, Calif. 92109

Filed Feb. 12, 1975, Ser. No. 549,158

Int. Cl.² A47C *4/00*

U.S. Cl. 297—19 **10 Claims**

1. An adjustable deck chair comprising:
   a. an upper platform and a lower platform connected together by a hinge joint to define an elongated deck portion of a chair;
   b. leg means pivoted to said upper platform to support same above a generally horizontal surface;
   c. brace means pivoted to said hinge joint and releasibly securable to said leg means;
   d. elongated means connected generally centrally to said lower platform and releasibly connectible to a lower portion of said leg means, whereby upon securing said leg means, brace means, and elongated means together, said



upper and lower platform are rigidly oriented at a set position.

3,929,374

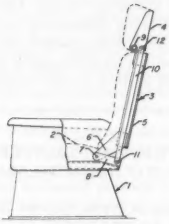
VEHICLE SEAT WITH HEADREST MOVEMENT RESPONSIVE TO SEAT BACK TILTING

Gerard T. Hogan, Southington, and Kirby B. Weik, Litchfield, both of Conn., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 4, 1974, Ser. No. 520,311

Int. Cl.² A47C *1/036, 31/00*

U.S. Cl. 297—61 **5 Claims**



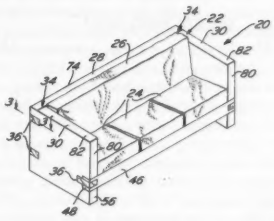
3. In a vehicle passenger seat having a seat section, seat support framing and a reclining seat back, the improved construction to provide a movable headrest section, which comprises in combination,
   a. an elongated tilting seat back section having a hinged connection at its lower end to fixed seat support framing,
   b. a relatively short tilting headrest section having a hinged connection from its lower portion to the forward part of the upper end portion of said seat back section and forming an extended portion for the latter,
   c. fixed length, stiff linking members along each side portion of said seat back section connected to said headrest section and connected to respective lower pivot means on the fixed seat support framing at locations rearward of said hinged connection for said back section, said linking members extending upwardly to upper pivot means on said headrest section, said pivot means being spaced from and positioned rearward of the hinged connection between the upper part of said seat back section and said headrest section,
   d. said linking members being positioned to be generally parallel to the tilting seat back section, such that as the latter is tilted from a generally upright position to a recline position there is a lowering of the top end portion of the seat back section relative to said upper pivot means between said linking members and said headrest section and a resulting forward tilting of the latter section with respect to the back section, and

e. a transverse lumbar support bar extending across the lower portion of said tilting seat back section in the zone of the lumbar region of a seat occupant, said support bar having fixedly connected arm members extending inwardly to pivotally connect with the side of said linking members to provide for arcuate movement of said support bar about the connecting points to said linking members, longitudinal slot means in the midportions of each of said arm members from said lumbar support bar to said linking members, and fixed pin means from each side portion of said seat back section positioned to extend through respective slot means for said arm members, whereby tilting movement of said seat back section provides a relative movement between the seat back framing and said linking members causing said fixed pin members in said slot means to move said arm members and said connecting lumbar support bar in an arcuate movement about the pivot connection means to said linking members.

3,929,375
KNOCK-DOWN SOFA

Charles C. Gans, 240 E. 35th St., New York, N.Y. 10016.

Filed Nov. 4, 1974, Ser. No. 520,708
Int. Cl.² A47C *7/00*
U.S. Cl. 297—440 **10 Claims**



1. A knock-down seating device comprising a frame supporting at least one cushion thereon, said frame comprising a back wall, a side wall and base for said cushion and supported by said back and said side walls, said back and side walls being connected to each other by a freely detachable joint, said joint being secured together by a fastening tape comprising first and second components, one of said components having two separate portions and the other component having only a single portion, one of said components having a plurality of hook-like elements thereon and the other component having a plurality of loop-like elements thereon, one separate portion of one component being permanently secured to the back wall and the other separate portion of said one component being permanently secured to the side wall, said other component bridging both of the separate portions of the said one component and being releasably secured to each.

3,929,376
METAL CHAIR

Richard Kates, c/o Federal Steel Corp., 2 Pennsylvania Plaza, New York, N.Y. 10001

Filed Sept. 3, 1974, Ser. No. 502,496
Int. Cl.² A47C *1/12*
U.S. Cl. 297—445 **18 Claims**

1. A metal chair comprising:

a seat frame forming a seat portion of the chair, said seat frame including

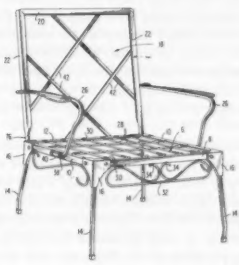
a front portion,

a back portion, and

side portions interconnecting said front and back portions,

a plurality of support legs depending from said frame, and countering means connected directly to one of said frame portions for resisting flexture of said frame in response to the application of a load thereupon, said countering means including

a tensile rod whose ends terminate short of said support legs, and

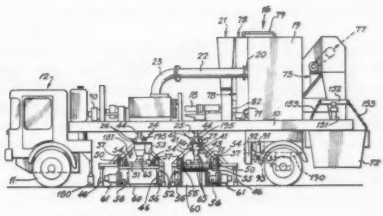


plural spacer portions for connecting said tensile rod directly to said one frame portion exclusive of connection to said support legs to space said tensile rod below said one frame portion in the region of maximum bending thereof, so that downward flexure of said front frame portion develops tensile forces in said tensile rod which resist such downward flexure.

3,929,377
VEHICLE-MOUNTED HARDENED CONCRETE GROOVING MACHINE

John Weaver, Beaconsfield; David Payne Maynard, Slough; Rayner Walter Taylor, Slough, and William Richards Gilbert Bayliss, Slough, all of England, assignors to The Cement and Concrete Association, London, England

Filed Jan. 18, 1974, Ser. No. 434,516
Int. Cl.² E01C *23/09*
U.S. Cl. 299—39 **12 Claims**



1. A vehicle constituting a self-contained roadway-grooving machine which comprises:

a. a vehicle chassis and roadway-engaging wheels for enabling said vehicle to be moved longitudinally of the roadway;

b. a supporting structure carried by said chassis comprising parallel tracks extending transversely both of said chassis and of said direction of movement of said vehicle along the roadway;

c. cutter means movable along said tracks in engagement with the roadway surface and operable to form at least two parallel grooves simultaneously in said roadway by a dry cutting action, said grooves extending transversely of said roadway;

d. roadway-surface cleaning means operable to pick up substantially all of the dry particulate material removed

by said cutter means during the formation of said at least two grooves;

e. said cleaning means comprising fan means and a deceleration chamber and an envelope all of which are interconnected by a pneumatic circuit said envelope enshrouding said cutter means and having a lower terminal edge closely adjacent to the roadway surface and said deceleration chamber being interposed in the pneumatic circuit between the fan means and the envelope;

f. said fan having intake and output apertures and being operable to produce negative air pressure at its intake aperture in order to create an airflow under said lower terminal edge towards said output aperture for the purpose of entraining substantially all of the dry particulate material removed by said cutting action from said roadway;

g. said pneumatic circuit including a manifold channel disposed above and parallel to said tracks on the supporting structure said channel being rigid and of inverted U-shape, the open bottom of said channel being closed by two elongated flexible flaps of elastomeric material, the upper portion of said envelope extending between said contacting portions of the flaps and said envelope moving along said channel as said cutter means moves along said tracks during groove formation, the resilience of the elastomeric material coupled with a negative air pressure within the channel ensuring an adequate degree of fluid-tightness between said flaps and around said upper portion of the envelope.

3,929,378

MINING MACHINE

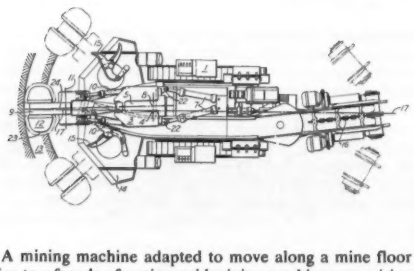
Pal Frenyo, Bochum; Wilhelm Bicker, Gelsenkirchen-Horst, and Werner Hellmuth, Dortmund, all of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed May 2, 1974, Ser. No. 466,130

Claims priority, application Germany, May 16, 1975, 2324661

Int. Cl.² E21C *35/02*

U.S. Cl. 299—64 **7 Claims**



1. A mining machine adapted to move along a mine floor relative to a facade of a mine, said mining machine comprising in combination:

a propulsion means including a chassis for movement along the mine floor relative to a facade of the mine, said chassis having two lateral sides lying symmetrically at opposite sides of a longitudinal plane extending along the center of the chassis;

a cutter head for working upon the facade of the mine;

a support beam for carrying said cutter head;

a universal support carried by said chassis at one lateral side thereof and spaced from said longitudinal plane of the chassis, said universal support including means to pivotally position said support beam about a horizontal axis spaced above the chassis, said universal support further including means to pivotally position said support beam about a vertical axis passing through the chassis at a horizontally spaced location from said longitudinal plane of the chassis;

a loading scoop supported by said chassis and including a projecting ore receiving surface sloped in a downward direction toward the mine floor outwardly of the chassis, said loading scoop having a central ore discharge surface intersected by said longitudinal plane of the chassis; and

a conveyor extending along said chassis for conveying ore in the general direction away from said cutting head, said conveyor essentially having an ore receiving end intersected by said longitudinal plane of the chassis, said ore receiving end being disposed in an ore transferring relation with the ore discharge surface of said loading scoop, said conveyor essentially including a laterally-curved conveyor section supported by said chassis at the second of said two lateral sides of said longitudinal plane in a manner such that the laterally-curved conveyor section extends below said horizontal axis and spaced laterally from both said horizontal axis and said longitudinal plane.

3,929,379

METHOD AND APPARATUS FOR THE PNEUMATIC CONVEYING OF BULK MATERIAL

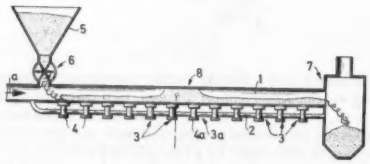
Wolfgang Krambrock, Ravensburg, Germany, assignor to Waeschle Maschinenfabrik GmbH, Ravensburg, Germany

Filed Jan. 30, 1974, Ser. No. 437,910

Claims priority, application Germany, Feb. 2, 1973, 2305030

Int. Cl.² B65G *53/16*

U.S. Cl. 302—24 **17 Claims**



1. An apparatus for the pneumatic conveying of bulk material, comprising a conveyor conduit; means for introducing conveyor gas into the conveyor conduit; means for introducing material to be conveyed into the conveyor conduit at a position downstream of the introduction of the conveyor gas; a by-pass conduit disposed adjacent said conveyor conduit; means to introduce gas into said by-pass conduit; means effective to substantially equate pressure distribution in the by-pass conduit to pressure distribution which occurs in the conveyor conduit in normal trouble-free pneumatic conveying; a plurality of connecting means connecting the by-pass conduit and the conveyor conduit at a plurality of positions spaced along the lengths thereof; and non-return valve means at each of said connecting means and individually openable for a flow of gas from the by-pass conduit into the conveyor conduit when the pressure in at least a part of the by-pass conduit is higher than the pressure in the conveyor conduit by a predetermined amount, each of said non-return valve means comprising a non-return valve and a shut-off valve operatively associated with said non-return valve, the shut-off valve being operable to close the by-pass conduit when the respective non-return valve is moved into its open position.

3,929,380
METHOD AND ARRANGEMENT FOR APPLYING OSCILLATING BRAKING PRESSURES TO VEHICLE WHEELS

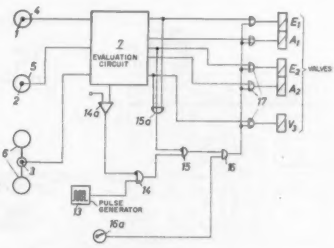
Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Dec. 14, 1973, Ser. No. 424,803

Claims priority, application Germany, Dec. 21, 1972, 2262557

Int. Cl.² B60T *8/00*

U.S. Cl. 303—21 F **12 Claims**



2. An arrangement for modulation of the brake pressure of a wheel brake of a vehicle, comprising a modulator connected in a brake pressure line to said wheel brake for varying the brake pressure therein; switch means connected to said modulator for controlling said modulator to provide an oscillation of said brake pressure; and a logic circuit connected between said switch means and said modulator for allowing said switch means to operate said modulator only at low brake pressures.

8. A method of modulating the brake pressure of a vehicle wheel brake for eliminating brake squealing, including a brake line and a modulator connected in the brake line for varying the brake pressure therein, comprising the following steps:

a. applying, during braking, a series of pulses to said modulator by a switch means for effecting a pressure oscillation in the brake line in response to the pulses;

b. selecting the duration of each pulse and each pulse between pulses to be just sufficiently long for effecting a large-amplitude pressure fluctuation in the pressure line to eliminate brake squealing;

c. decreasing the pressure in the brake line by an anti-lock means when the associated vehicle wheel shows a tendency to lock; and

d. preventing, when said wheel shows a tendency to lock, said switch means from operating the modulator by means of a logic circuit connected to the anti-lock means, the switch means and the modulator.

3,929,381
PNEUMATIC BRAKE SYSTEM FOR A TRACTOR-TRAILER VEHICLE INCLUDING AN ANTI-LOCK CONTROL VALVE IN THE TRAILER BRAKE SYSTEM

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 11, 1974, Ser. No. 449,730

Int. Cl.² B60T *8/06, 15/16*

U.S. Cl. 303—21 F **3 Claims**

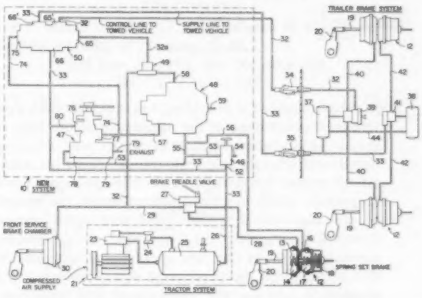
3. A vehicle brake system for braking a tractor coupled to a towed trailer by means of a source of fluid supplied to said system under supply and variable signal pressures, said trailer adapted to be equipped with associated, fluid-operated devices, said system comprising:

a plurality of spring-set brake actuators on said tractor, each actuator having a first chamber operable by said source under signal pressure to normally brake said tractor and trailer, spring means operable in a release position to brake said vehicle in an emergency condition and a second chamber operable by said source under supply pressure to maintain said spring means in a compressed inoperable manner under normal operating conditons;

a plurality of brake actuators on said trailer, each trailer actuator having a service brake chamber effective to actuate said trailer actuator when suppiled with said source of fluid;

trailer valve means on said trailer including first and second brake lines and a relay valve, said trailer valve means operable in a normal position by fluid under supply pressure in said first line to communicate fluid in said second line under signal pressure to said trailer brake actuators and automatically shifted to an emergency position upon sensing a drop in pressure of said fluid in said first line to actuate said trailer brake actuators;

a manually operable park valve on said tractor having an inlet connected to said source under supply pressure, an outlet and a vent, said park valve having a released position communicating its inlet with its outlet and an applied position communicating its outlet with its vent effective to actuate said spring means and shift said trailer valve means to its emergency position;



control valve means including a control valve on said tractor having a first inlet in communication with said source under supply pressure, a second inlet in communication with said outlet of said park valve, and at least a first outlet, said control valve means manually operable to a fill position when said park valve is in its applied position to communicate said first inlet with said first outlet of said control valve;

automatic valve means on said tractor in fluid communication with said outlet of said control valve and in fluid communication with said trailer valve means, said automatic valve means operable when said park valve is in its applied position and said control valve means is in its fill position to port fluid under supply pressure to both said first and second brake lines of said trailer valve means whereby said trailer brake actuators are actuated while said first line may be adapted to simultaneously operate said assocaited devices; and

said control valve means automatically disengages from said fill position when said park valve is manually operated to said release position, and said automatic valve means responds to said movements of said park valve and said control valve means to vent fluid at supply pressure from said second brake line.

3,929,382
SKID CONTROL SYSTEM

Joseph H. McNinch, Jr., Oak Park; John A. Urban, Livonia, and Gary L. Hopkins, Southfield, all of Mich., assignors to Eaton Corporation, Ohio

Filed May 10, 1974, Ser. No. 468,905

Int. Cl.² B60T *8/04*

U.S. Cl. 303—21 BE **18 Claims**

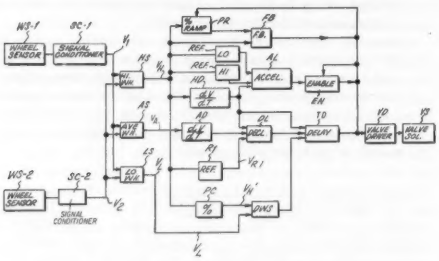
1. A skid control system for use with a vehicle having at least first and second spaced apart independently rotatable

wheels and having a braking system for applying braking forces to said wheels and comprising:

brake means responsive to an applied skid signal for controlling said braking system to relieve the braking forces on said wheels;

means for providing first and second wheel speed signals having values respectively representative of the wheel speed of the first and second wheels;

means for receiving said wheel speed signals and providing therefrom a high wheel speed signal representative of the speed of the faster wheel and a low wheel speed signal representative of the speed of the slower wheel; and



logic circuit means for providing a skid signal when a predetermined percentage of the magnitude of the high wheel speed signal differs from that of the low wheel speed signal, and wherein said logic circuit means includes first circuit means for deriving a percentage signal having a magnitude which is a fixed percentage of the magnitude of said high wheel speed signal, and signal comparing means for comparing the magnitude of said percentage signal with that of said low speed signal and providing a skid signal when the percentage signal exhibits a greater magnitude than said low speed signal, and further including means for delaying application of said skid signal to said brake control means for a time duration that varies as a function of the speed of the faster wheel.

3,929,383

SKID CONTROL SYSTEM INCLUDING A RELAY COMPENSATOR VALVE FOR RAPID BRAKE PRESSURE RE-APPLICATION FOLLOWED BY SLOWER RATE OF PRESSURE RE-APPLICATION

John A. Urban, Livonia, and Gary Lee Hopkins, Farmington, both of Mich., assignors to Eaton Corporation, Ohio

Continuation-in-part of Ser. No. 458,608, April 8, 1974, which is a continuation of Ser. No. 293,868, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 271,824, July 14, 1972, abandoned, which is a continuation of Ser. No. 125,280, March 17, 1971, abandoned. This application Sept. 26, 1974, Ser. No. 509,527

Int. Cl.[2] B60T *8/02, 15/12*

U.S. Cl. 303—21 F **9 Claims**

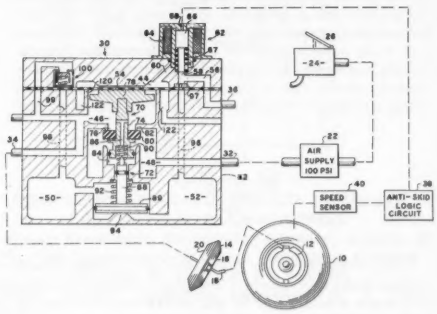
5. In a skid control system for use in controlling the braking pressure applied to a wheel, said system including a brake for applying braking forces to the wheel, a fluid pressure operated brake actuator for actuating said brake, skid control sensor means for detecting a skid condition at the wheel and generating an electrical signal in response thereto, a source of pressurized fluid for application to said brake actuator, means for supplying a variable control pressure and a compensating skid control valve in said system for cyclically applying fluid pressure to said brake actuator in response to the electrical signal generated by said skid control sensor means, said skid control valve comprising:

a. a valve housing defining an inlet pressure chamber, an outlet pressure chamber and a compensating pressure chamber;

b. a valve passage communicating between said inlet and outlet pressure chambers;

c. control valve means disposed in said valve passage, said control valve means including a piston portion having a surface thereof operatively exposed to the pressure in said compensating pressure chamber; the opening of said control valve means being at least partially a function of the pressure in said compensating pressure chamber;

d. means defining a flow passage communicating between said outlet pressure chamber and said compensating pressure chamber, said flow passage defining means including flow restricting means; and



e. pressure modulator valve means disposed in said flow passage, said pressure modulator valve means being operable to fluidly bypass said flow restricting means, in a direction from said outlet pressure chamber towards said compensating pressure chamber, in response to at least a predetermined pressure differential between said outlet pressure chamber and said compensating pressure chamber to maintain said compensating pressure no more than said predetermined pressure differential below said outlet pressure during a first brake application to provide, during a second brake application, a compensating pressure which is a predictable function of the peak outlet pressure during said first brake application.

3,929,384

EMPTY AND LOAD BRAKE APPARATUS

Glen D. Larsen, Upper Marlboro, Md., assignor to Southern Railway Company, Washington, D.C.

Filed Oct. 9, 1974, Ser. No. 513,463

Int. Cl.[2] B60T *8/20*

U.S. Cl. 303—22 R **2 Claims**

1. Empty and load brake apparatus for a railway car having a sprung part including a bolster vertically deflectable to varying degrees relative to an unsprung part of said car in accordance with the load on said car, comprising, in combination:

brake cylinder means operative for effecting a brake application when pressurized and a brake release when depressurized;

a variable capacity brake valve for said brake cylinder means, comprising:

a valve cylinder having a bore, said valve cylinder being mounted on said sprung part and communicating with said brake cylinder means;

a valve seat member mounted within said bore, said valve seat member having a passageway through which pressurized air from said brake cylinder means communicates;

a poppet valve slidably disposed in said bore for opening and closing said passageway as said poppet valve moves toward and away from said valve seat member;

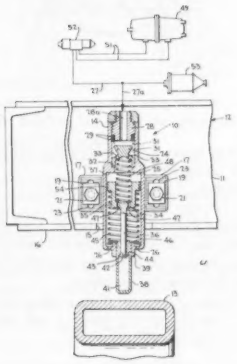
a first spring urging said poppet valve into a closing position against said valve seat member;

a slidable movable feeler element extending outwardly of said valve cylinder;

a plunger movable within said valve cylinder and bearing against said first spring;

a second spring disposed between said plunger and said feeler element; and

vent openings in said cylinder, said poppet valve and said plunger for venting fluid under pressure from said passageway during a braking operation and out through said valve cylinder upon predetermined movement of said poppet valve away from said valve seat into an open position responsive to fluid pressure established



in said brake cylinder means which exceeds a predetermined value depending on the load on said car;

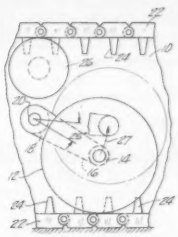
said feeler element being movable in the same direction of deflection of said bolster into contact with a surface of said unsprung part during a loaded car condition and out of contact therewith during an empty car condition, whereby the fluid pressure established in said brake cylinder means is limited to a predetermined minimum during the empty car condition, and the fluid pressure is increased at a variable rate in accordance with an increased loaded car condition as the tension of said first spring is variably increased during inward movement of said feeler element.

3,929,385
VEHICLE TRACK SUPPORT

Richard R. Turkiewicz, Warren, and Anthony J. Volino, Detroit, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,875
Int. Cl.² B62D *55/20*
U.S. Cl. 305—56 **10 Claims**

1. In a tracked vehicle: two independently rotatable rollers underlying the return run of the track to absorb vertical forces; said rollers being axially aligned with one another on opposite sides of the path taken by the teeth that project downwardly from the track; each roller having a radius that is less than the track tooth height, whereby the tooth path intersects the roller centerline; the central space between the

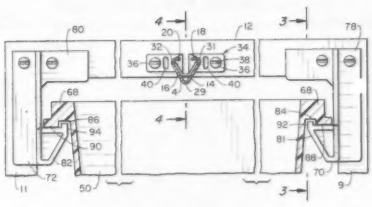


rollers being unobstructed for a sufficient vertical distance to permit passage of the track teeth therethrough.

3,929,386
V-RAIL AND DRAWER MOUNTING SYSTEM THEREWITH

George D. Read, Glendora, Calif., assignor to Ajax Hardware Corporation, City of Industry, Calif.

Filed Nov. 5, 1973, Ser. No. 413,184
Int. Cl.² F16C *17/00*
U.S. Cl. 308—3.6 **15 Claims**



1. A drawer support system including a drawer structure and a rail support system, the combination including: an elongated rail of sufficient length to span the length of said drawer structure in which a drawer is to be supported, said rail being integrally formed and having a V-like shape in cross-section, comprising intersecting, non-curvilinear opposed legs and upper leg portions forming the base of said V-like shape, said upper leg portions of the V having inwardly directed, horizontal flange ends terminating in spaced relationship, said rail forming an elongate guide path, the depth of said V and the formed interior area being sufficient to receive end supporting members in telescopic relationship.

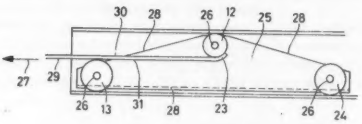
3,929,387
DRAWER GUIDE FOR HEAVY DRAWERS

Alfred Grass, Konsumstrasse 492, A-6973 Hochst, Vlbg.-Osterreich, Austria

Filed May 13, 1974, Ser. No. 469,618
Claims priority, application Germany, May 15, 1973, 2324558
Int. Cl.² F16C *17/00*
U.S. Cl. 308—3.8 **9 Claims**

1. A drawer support to be secured to a housing, comprising a guide member forming an elongated channel with upper and lower bearing surfaces, a movable load support member in the channel, three cylindrical bodies, means for journalling said cylindrical bodies at only three spaced positions on the load support member, said three journalling positions being located such that straight lines joining them form a triangle whose base generally parallels the lower bearing surface of the guide

member, said load support member being positioned in the channel with the cylindrical bodies journalled at the triangle base engaging the guide member lower bearing surface and the cylindrical body journalled at the triangle apex engaging the guide member upper bearing surface, the base-journalled cylindrical bodies being located in the proximity of the corners of the load support member, means for mounting on the drawer and forming an elongated member extending between the apex-journalled cylindrical body and the base-journalled cylindrical bodies and engaged by at least the apex cylindrical body and the base cylindrical body forward of the apex cylindrical body, and means for mounting of the guide member on the drawer housing.

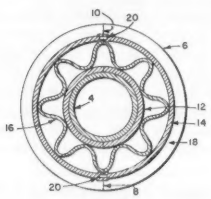


3,929,388

WELL PIPE PROTECTOR

Adolph A. Sutko, Ponca City, Okla., and George M. Myers, Houston, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Sept. 19, 1974, Ser. No. 507,318
Int. Cl.² F16C *1/26*
U.S. Cl. 308—4 A **3 Claims**



1. A well pipe protector comprising:

a. an inner steel cylinder having two diametrically opposite longitudinal splits, said inner steel cylinder sized to fit tightly about the well pipe;

b. an outer steel cylinder having two diametrically opposite longitudinal splits, said outer steel cylinder being concentric with and encompassing said inner steel cylinder to provide an annular space therebetween;

c. a corrugated steel cylindrical band having two diametrically opposite longitudinal splits therein, said corrugated steel cylindrical band being positioned in the annular space between said inner and outer steel cylinders, having corrugations running axially of the protector, presenting crests which alternately engage the outer surface of the inner steel cylinder and the inner surface of the outer steel cylinder, being bonded to the inner and the outer steel cylinders, and allowing for flow of fluid axially between said inner and outer steel cylinders;

d. an elastomeric sleeve having two diametrically opposite longitudinal splits therein, said sleeve surrounding and being bonded to the outer steel cylinder and concentric therewith;

e. said inner steel cylinder, outer steel cylinder, corrugated steel cylindrical band and elastomeric sleeve all with two diametrically opposite longitudinal splits providing two semi-cylindrical half sections, and

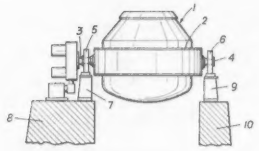
f. latching means for joining the two semi-cylindrical half sections of the protector about a well pipe.

3,929,389

EXPANSION BEARING ASSEMBLY FOR A CONVERTER CARRYING TRUNNION

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 27, 1974, Ser. No. 527,536
Claims priority, application Austria, Dec. 7, 1973, 10249/73
Int. Cl.² F16C *17/00, 21/00, 33/02*
U.S. Cl. 308—6 R **16 Claims**



1. An expansion bearing assembly for a converter carrying trunnion, which comprises

a bearing housing,

an expansion bearing stand,

a sliding bushing provided with bores, said sliding bushing being axially displaceable within the bearing housing,

an inner race secured in place by means of distance rings fastened to the carrying trunnion,

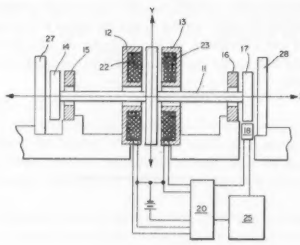
cylindrical blocks acting as sliding elements peripherally distributed over the sliding bushing and inserted into the bores of the sliding bushing.

3,929,390

DAMPER SYSTEM FOR SUSPENSION SYSTEMS

Paul A. Simpson, Brookline, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Dec. 22, 1971, Ser. No. 211,030
Int. Cl.² F16C *39/06*
U.S. Cl. 308—10 **2 Claims**



1. Damping apparatus for magnetic bearing systems, which apparatus comprises:

a magnetically suspended movable object;

means for rotating said movable object;

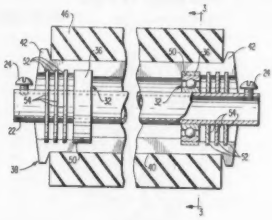
means for obtaining radial and axial damping of said movable object, each damping means comprising a conductive plate which has a resistivity of less than about 3 microhm-centimeters at 20°C. and a magnet which has a peak energy product of at least about 7.25 megagauss-oersteds and a permeability of less than 5; and

magnet means for maintaining the movable object in an equilibrium position, which magnet means is different from the damping means.

3,929,391
CONVEYOR BELT IDLER ROLLERS

Francisco A. Pico, 1212 N. El Paso St., El Paso, Tex. 79902

Filed Nov. 19, 1974, Ser. No. 525,224
Int. Cl.² F16C 35/06
U.S. Cl. 308—20 14 Claims



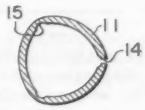
1. Roller structure comprising
a. shaft means having an axis of symmetry,
b. means for holding the shaft means against rotation relative to a mounting member,
c. a roller body member concentrically disposed relative to the axis of symmetry of the shaft means and radially spaced outwardly from the shaft means,
d. the roller body member comprising a plurality of separable segments extending in the direction of the axis of symmetry,
e. inner bearing raceway means carried by the shaft means in nonrotatable relation to the shaft means,
f. outer bearing raceway means disposed in coacting relationship to the inner bearing raceway means,
g. roller bearing means between the inner bearing raceway means and the outer bearing raceway means,
h. elastic sleeve means having an outer cylindrical wear surface surrounding and resiliently holding the roller body member segments in contact with the outer bearing raceway means while permitting thermal expansion of the roller parts, and
i. means associated with the roller body member normally holding the outer bearing raceway means against rotation relative to the roller body member,
j. the last claimed means including a relatively low coefficient of friction surface means on the roller body member in contact with the outer bearing raceway means, the friction between the relative low coefficient of friction surface means and the outer bearing raceway means during normal use of the roller being greater than the friction between the inner bearing raceway means and the outer bearing raceway means but upon abnormally high friction arising between the outer bearing raceway means and the inner bearing raceway means, rotation of the roller can continue by virtue of relative movement of the lower coefficient of friction surface means and the outer bearing raceway means.

3,929,392
RESILIENT BEARING STRUCTURE

Michihiro Ogino, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Feb. 11, 1974, Ser. No. 440,973
Claims priority, application Japan, Feb. 15, 1973, 48-17853
Int. Cl.² F16C 27/00
U.S. Cl. 308—26 2 Claims

1. A resilient bearing bushing for use between a rotatingly or slidingly operating cylindrical shaft and a cylindrical housing for said shaft, said resilient bearing bushing comprising a generally tubular body having three arcuate side walls and three arcuate vertices, said side walls each having inner surfaces which are arcuate along their entire circumferential extent, each of said inner arcuate surfaces having a central, circumferential portion constituting a major portion of said arcuate inner surface, said central, circumferential portion resiliently pressed against a corresponding circumferential portion of said shaft, said side walls each having outer surfaces which are arcuate along their entire circumferential extent and which are radially spaced from the inner periphery of said cylindrical housing, said vertices having outer surfaces resiliently pressed against the inner periphery of said cylindrical

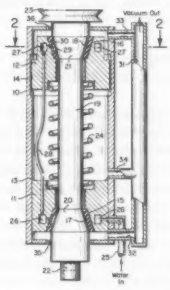


housing and inner surfaces spaced from the circumference of said shaft, said tubular body having three recesses formed on the inner surface of said tubular body in positions corresponding to said vertices, said recesses having a wall thickness smaller than the thickness of the remaining portions of the tubular body such that the thickness of said tubular body at said vertices is less than the thickness of said tubular body at the remaining portions thereof.

3,929,393
WATER-RUBBER BEARING HIGH SPEED DRILL SPINDLE

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

Filed Feb. 14, 1975, Ser. No. 549,860
Int. Cl.² F16C 1/24, 3/14, 3/16, 33/66
U.S. Cl. 308—76 9 Claims



1. A water rubber bearing high speed drill spindle comprising, in combination:
a. an outer cylindrical barrel;
b. lower and upper bearing blocks disposed in the lower and upper ends of said barrel, respectively, defining annular tapered surfaces;
c. lower and upper rubber bearing bushings secured to said surfaces and of conical shape to match the tapered surfaces, the taper of the surfaces and rubber bushings of the lower and upper bearing blocks being in opposite directions;
d. a shaft passing through said rubber bushings and having lower and upper end portions tapered in opposite directions to match the taper of the bushings, one of said bearing blocks being axially movable within said barrel, and the other bearing block being locked to said barrel;
e. biasing means in said barrel urging the axially movable bearing block in the direction of increasing taper so that both of said rubber bushings are biased into engagement with the respective tapered surfaces of said shaft to leave substantially zero clearance; and,

f. water passage means in said bearing blocks and rubber bushings for introducing water between the engaging conical surfaces of the rubber bushings and tapered end portions of the shaft whereby said shaft is "floated" on a water bearing supplied by the water in the pores of the rubber bushings, said biasing means permitting swelling of the rubber bushings when saturated with water and yet maintaining the desired substantially zero clearance of the bearing surfaces.

3,929,394

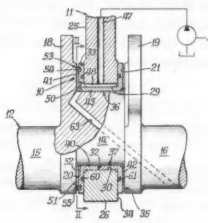
SHAFT JOURNAL BEARING LUBRICATION SYSTEM

David E. Hackett, Washington, and Frank E. Keske, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 30, 1975, Ser. No. 591,664

Int. Cl.² B61F *17/00*; **F16C** *13/02*, *1/24*, *33/66*

U.S. Cl. 308—121 **14 Claims**



1. A lubrication system, for a journal box and a cylindrical journal of a shaft rotatably mounted within such journal box, comprising:

a radially extending shoulder provided on the shaft at one end of said journal in juxtaposed relation to said journal box;

annular bearing means carried by said journal box in circumferentially embracing relation about said journal and having a predetermined clearance therewith to permit relatively free rotation of the shaft therewithin; and

lubricating means including means between said shoulder of the shaft and the adjacent end of said bearing means forming a sealed annular chamber for lubricating fluid in communication with said clearance for directing a flow of such fluid axially through said clearance for lubrication of said bearing means and journal.

3,929,395

THRUST BEARING RETAINER

Dieter Stojek, Bergisch Gladbach, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 13, 1975, Ser. No. 540,760

Int. Cl.² F16C *3/06*, *9/02*, *13/04*, *35/00*

U.S. Cl. 308—167 **5 Claims**

1. Internal combustion engine structure including an engine block having crankshaft support means, a crankshaft mounted within said support means to rotate about a given axis,

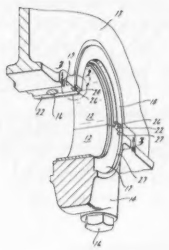
said crankshaft support means comprising a web member and a cap member, a pair of surfaces of said web member adjoining a pair of surfaces of said cap member at a plane which includes the axis of rotation of said crankshaft,

said crankshaft and said support means having axially adjacent surfaces,

thrust bearing means separating said axially adjacent surfaces, said surface on said bearing support means comprising an annular recess, each of said thrust bearing means comprising a partial annulus positioned between said adjacent surfaces,

an axially extending slot formed in each of the adjoining surfaces of one of said members comprising said crankshaft support means,

clip means including a portion received within said slot generally parallel to said plane, said clip means including



a pair of end legs positioned generally perpendicularly to the slot received portion of said clip means, said end legs being received within said annular recess and engaging the ends of said partial annulus to prevent rotation of said partial annulus within said annular recess.

3,929,396

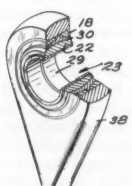
MOLDED PLASTIC BEARING ASSEMBLY

Stanley S. Orkin, Rockville, and Edward John Nagy, Windsor, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Continuation-in-part of Ser. No. 241,007, April 4, 1972, Pat. No. 3,806,216. This application Mar. 18, 1974, Ser. No. 452,359

Int. Cl.² F16C *1/24*, *33/00*; **C10M** *5/00*, *7/00*

U.S. Cl. 308—241 **11 Claims**

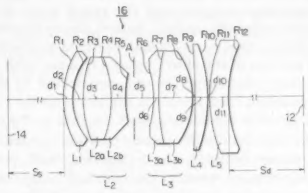


1. A bearing assembly comprising two coengaging members movable relative to one another, the first of said members having a ceramic bearing surface provided by a thin ceramic coating on a metal substrate the thickness of said ceramic coating ranging from 0.0001 to 0.02 inches and the bearing surface of said other member comprising a molded mixture of a curable acrylate composition and particulate solid lubricant, the bearing surface of said first member being coated with a thin film of a parting agent to prevent adhesion thereof to said molded bearing surface.

3,929,397
PROJECTION LENS

Motoaki Kawazu, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed July 1, 1974, Ser. No. 484,975
Claims priority, application Japan, Aug. 30, 1973, 48-96726
Int. Cl.² G02B 9/60
U.S. Cl. 350—216 2 Claims



1. A projection lens for a projector illumination system in which an image of a projection light source is focussed into a projection lens aperture to substantially fill the aperture, comprising, in combination:

a diverging first meniscus lens spaced between the aperture and a viewing surface and having a convex surface facing the viewing surface and a concave surface facing a document being projected;

a first doublet lens spaced between the aperture and the first meniscus lens having a convex surface facing the viewing surface and a concave surface facing the document;

a second doublet lens spaced between the aperture and the document having a concave surface facing the viewing surface and a convex surface facing the document;

a converging second meniscus lens spaced between the second doublet lens and the document having a concave surface facing the viewing surface and a convex surface facing the document; and

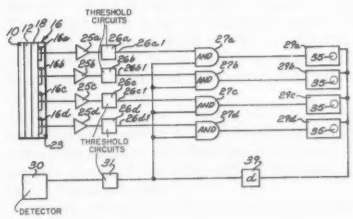
a third meniscus lens spaced between the second meniscus lens and the document having a convex surface facing the viewing surface and a concave surface facing the document; whereby

the radii of curvature of the surfaces of the third meniscus lens are selected to adjust the back focus distance of the projection lens to a value at which the image of the light source is focussed into the aperture and to correct, in conjunction with said other lenses, astigmatism, coma and distortion occurring in the projection lens.

3,929,398
HIGH SPEED OPTICAL WAVELENGTH DETECTION SYSTEM

Harry E. Bates, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Aug. 18, 1971, Ser. No. 172,797
Int. Cl. G01j 3/48
U.S. Cl. 356—186 22 Claims

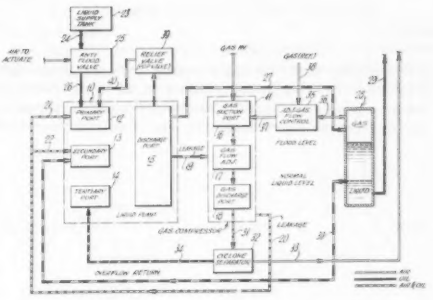


20. In an apparatus for determining the wavelength of light, first means for receiving and transmitting the light whose wavelength is to be measured, and a plurality of detectors, said first means comprising means for selectively transmitting or blocking light to each of said detectors as a function of the wavelength of the light, to transmit unique combinations of inputs to said detectors for different wavelengths.

3,929,399
METHOD AND APPARATUS FOR PUMPING A LIQUID AND COMPRESSING A GAS

David Aronson, Upper Montclair, N.J., assignor to Compump Systems, Inc., Newark, N.J.

Filed June 5, 1974, Ser. No. 476,673
Int. Cl.² F04B 23/10; H01V 1/30
U.S. Cl. 417—54 21 Claims



19. The method of pumping a liquid and compressing a gas to deliver liquid at a predetermined rate and gas at a predetermined pressure comprising the steps of feeding liquid under pressure from a supply to a reservoir containing both liquid and gas, feeding back a two phase fluid containing liquid and gas, from said reservoir to said pump, the relative percentages of liquid and gas in said fed back two phase fluid controlling the rate of liquid fed from said supply to control and maintain a selected liquid level in said reservoir whereby said pump processes a two-phase fluid and feeds the two-phase fluid to said reservoir, feeding gas to said compressor for delivery of a compressed gas, coupling said reservoir to a gas supply and to said compressor and controlling the flow of gas into and out of said reservoir to maintain a selected gas pressure therein and controlling the rate of compression of said gas and effecting delivery of said liquid and gas to the place of use.

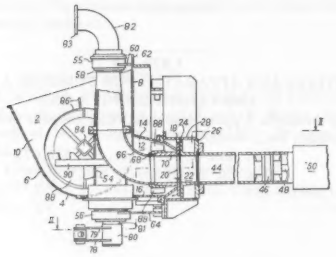
3,929,400
SLURRY PUMPS

Harry Merton, Maidstone, and Thomas Michael Howlitt, Gillingham, both of England, assignors to Winget Limited, Rochester, England

Filed Aug. 9, 1973, Ser. No. 387,165
Claims priority, application United Kingdom, Aug. 9, 1972, 37143/72
Int. Cl. F04b 15/02
U.S. Cl. 417—516 5 Claims

1. A slurry pump having a framework, fixedly mounted on the framework first and second pump cylinders, hingedly

mounted on the framework a slurry hopper readily separable from the pump cylinders by rotation about an upright hinge mounting from a normal position in which the pump cylinders communicate with the interior of the slurry hopper, pistons in



the respective first and second pump cylinder, each piston provided with drive means adapted to move the piston between a position adjacent the slurry hopper to a position remote from the slurry hopper by way of an induction stroke and from a position remote from the slurry hopper to a position adjacent the slurry hopper by way of a discharge stroke, extending into the slurry hopper an upright, hollow, slurry discharge column, extending horizontally from the upright, hollow, slurry discharge column and in communication therewith a radial duct formed at an end portion remote from the upright, hollow, slurry discharge column with a cylindrical end wall face co-axial with the upright, hollow, slurry discharge column axis, means adapted to rotate the upright, hollow slurry discharge column and the radial duct through a restricted arc about the upright, hollow, slurry discharge column axis between a first position and a second position, a cylindrical wall portion of the slurry hopper co-axial with the upright, hollow, slurry discharge column penetrated by the first and second passages respectively in register with the radial duct in the first position connecting with the first pump cylinder and with the radial duct in the second position connecting with the second pump cylinder, the cylindrical wall portion being formed of abrasion resistant material and being readily removable upon rotating the slurry hopper about the upright hinge to separate the slurry hopper from the cylinders, and means interconnecting the drive means for each piston and the means adapted to rotate the hollow column such that the induction stroke is made with the respective pump cylinder in communication with the slurry hopper interior and the discharge stroke is made with the respective pump cylinder in communication with the radial duct.

3,929,401
ANTHRAQUINONE DYESTUFFS

Friedrich Wilhelm Kröck, Opladen, and Rütger Neeff, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

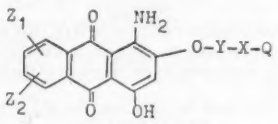
Filed Jan. 16, 1974, Ser. No. 433,693

Claims priority, application Germany, Jan. 16, 1973, 2301892

Int. Cl.² C09B *5/62*

U.S. Cl. 8—39 **3 Claims**

1. Process which comprises the dyeing or printing of synthetic fiber materials in an aqueous medium containing a dyestuff which is free of sulphonic acid groups and carboxylic acid groups and has the formula



wherein

Y is a straight-chain or branched-chain C_2–C_{16}-alkylene or such an alkylene interrupted by one or more ether oxygen atoms or by a cyclohexylene;

X is oxygen or sulphur;

Q is aralkyl; and

Z_1 and Z_2 are hydrogen or halogen.

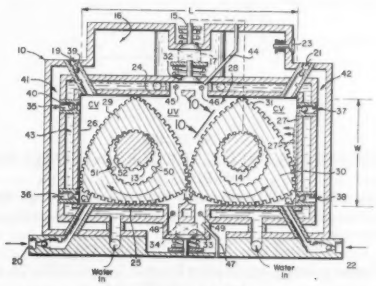
3,929,402
MULTIPLE ROTARY ENGINE

Emil Georg Schubert, 4210 Kenyon Ave., Los Angeles, Calif. 90066

Filed Dec. 2, 1974, Ser. No. 528,635

Int. Cl.² F02B *55/14*; **F01C** *1/02*

U.S. Cl. 123—8.47 **20 Claims**



1. A multiple rotary internal combustion engine comprising, in combination:

a. a casing having a rectangular interior incorporating left and right rotors in side-by-side relationship, the length of the interior being twice its width and each of the rotors having peripheries defined by three equal arcs of radius of curvature equal to said width so that they are always in physical contact with each other and the walls of the rectangular interior;

b. inter-engaging means coupling said rotors together for simultaneous rotation in opposite directions, rotation of said rotors defining with their peripheries and the central portion of one of the long walls of the rectangular interior, a variable volume;

c. inlet and exhaust valves connecting with said variable volume;

d. means for introducing an air-fuel mixture into said volume through said inlet valve when minimum in size; and,

e. means for igniting said air-fuel mixture, said inlet and exhaust valves operating in response to given rotor positions to provide a four-cycle engine operation for every two-thirds rotation of the rotors.

3,929,403
PROCESS FOR PRODUCING INDOANILINES AND KERATIN FIBER DYE COMPOSITION CONTAINING THE SAME

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

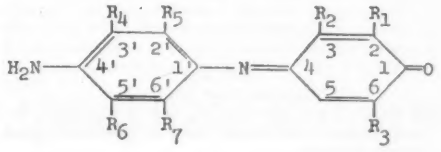
Continuation-in-part of Ser. No. 97,395, Dec. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 45,564, June 11, 1970, abandoned. This application Feb. 28, 1973, Ser. No. 336,802

Claims priority, application Luxemburg, June 11, 1969, 58848

Int. Cl.² A61K *7/12*, *7/13*, *7/135*; **D06P** *1/32*

U.S. Cl. 8—10.1 **9 Claims**

1. A hair dye composition consisting essentially of a solution of an indoaniline in a solvent selected from the group consisting of water and an aqueous solution of a lower alkanol, said indoaniline having the formula



which formula does not exclude the tautomeric forms thereof, and wherein R_1 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, a ureido radical, -NHCOR wherein R is lower alkyl;

R_2 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, a ureido radical, -NHCOR wherein R is lower alkyl, and -NHR_8 wherein R_8 is selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl and carbamylmethyl, with the proviso that when R_2 is -NHR_8, R_3 is not hydrogen;

R_4, R_5, R_6 and R_7 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy and said indoaniline being present in said dye composition in amounts ranging between 0.02 to 0.3 weight percent of said composition.

3,929,404
INDOANILINES IN KERATINIC FIBER DYE COMPOSITIONS

Gregoire Kalopissis, Paris; Andrée Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

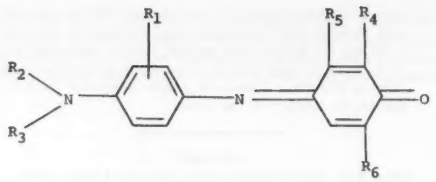
Filed June 24, 1974, Ser. No. 482,523

Claims priority, application Luxemburg, June 22, 1973, 67860

Int. Cl.² A61K *7/13*

U.S. Cl. 8—10.1 **13 Claims**

1. A dye composition for keratinic fibers comprising an aqueous or hydroalcoholic solution of an indoaniline of the formula



wherein

R_1 represents hydrogen, halogen, alkyl or alkoxy;

R_2 represents alkyl, hydroxyalkyl, carbamylalkyl, piperidinoalkyl, morpholinoalkyl, sulfoalkyl, acylaminoalkyl or mesylaminoalkyl;

R_3 represents hydroxyalkyl, carbamylalkyl, piperidinoalkyl, morpholinoalkyl, sulfoalkyl, acylaminoalkyl or mesylaminoalkyl; or R_2 and R_3 together with the nitrogen atom to which they are attached form piperidino or morpholino; R_4, R_5 and R_6 each independently represents hydrogen, halogen, alkyl, acylamino, ureido or carbalkoxyamino and R_5 can also represent amino, hydroxyalkylamino or carbamylalkylamino, the alkyl and alkoxy groups containing 1 to 6 carbon atoms, said indoaniline being present in an amount of 0.02 to 2 percent by weight of said composition.

3,929,405

COLOURATION PROCESS

Cyril Morris, and Arthur Topham, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 63,640, Aug. 13, 1970, abandoned. This application Aug. 8, 1973, Ser. No. 386,571

Claims priority, application United Kingdom, Aug. 18, 1969, 41059/69

Int. Cl.² C09B *1/00*

U.S. Cl. 8—39 **6 Claims**

1. A process for coloring polyester textile material comprising treating said textile material with a stable deflocculated dispersion of a finely divided disperse dyestuff in a halogenated aliphatic hydrocarbon which contains dissolved therein as a deflocculating agent polyureas which are essentially free from basic amino groups and which contain at least two urea groups and at least two alkyl, alkenyl or alkapolyenyl groups, each of which contains at least 8 carbon atoms, said polyureas being the reaction product of a polyisocyanate and an amine containing said alkyl, alkenyl or alkapolyenyl groups and then removing the halogenated aliphatic hydrocarbon, the said textile material being heated to a temperature between 50°–220°C simultaneously with or subsequent to the treatment with the dispersion.

3,929,406

METHOD OF DETECTING DEFECTS AND COMPOSITION THEREFOR

Larry B. Farmer; James E. Hendrix, and Hans H. Kuhn, all of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed May 21, 1973, Ser. No. 361,994

Int. Cl.² D06P *3/00*

U.S. Cl. 8—164 **23 Claims**

1. A method of detecting defects in fabrics comprising the steps of:

a. applying to a fabric, a composition comprising a fugitive polyethyleneoxy modified dyestuff and a solvent mixture containing at least two miscible solvents of differing polarity which are substantially immiscible when exposed to the atmosphere in thin films, and

b. permitting said composition to undergo phase separation on said fabric whereby the tint migrates with one of the solvents to a portion of the fabric to facilitate visual inspection of the fabric.

3,929,407

PROCESS FOR DYEING OF NOVOLOID FIBERS

Roy B. Parker, Perkasie, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1974, Ser. No. 482,307

Int. Cl.² C08J *3/20*

U.S. Cl. 8—168 **14 Claims**

1. A process for dyeing an unmodified novoloid fiber comprising the steps of:

a. placing the fiber in an approximately 100°F mixture of:

1 water,

2 1 to 5 grams per liter of butyl benzoate dyestuff carrier,

3 0.1 to 10.0 per cent based on weight of fiber of the group consisting of cationic and dispersed dyestuffs,

4 a sufficient quantity of a suitable chemical for maintaining a pH of the mixture of essentially 4.5 to 6.5;

b. heating the mixture to a high temperature of between 240°F to 300°F;

c. holding the mixture at the high temperature of step (b) for at least 1 ½ hours; and

d. cooling the mixture and fabric to approximately 140°F to 180°F.

3,929,408

PROCESS FOR DYEING TEXTILE MATERIALS BASED ON POLYAMIDE

Georges Ravet, Champagne au Mont d'Or, and Jean-Bernard Chaux, Tassin la Demi-Lune, both of France, assignors to Soprosole, Courbevoie, France

Filed Dec. 3, 1973, Ser. No. 420,975

Claims priority, application France, Dec. 6, 1972, 72.44078

Int. Cl.² D06P *5/04*

U.S. Cl. 8—169 **10 Claims**

1. A process for dyeing polyamide textile materials comprising:

forming an aqueous bath containing an admixture consisting essentially of 0.10 to 1.50 grams/liter of said bath of a first anionic leveling agent of the formula $R\ A_nR'$, in which R and R′ are sulfonated benzene or naphthylene rings, A is CH_2, SO_2 or NH and n is an integer from 0 to 4; 0.15 to 2.0 grams/liter of said bath of a second anionic leveling agent of a salt of an organic acid of the alkylaryl-sulfonic type or the polyalkyl-aryl-sulfonic type; 0.10 to 1.5 grams/liter of said bath of a cationic weak complexing agent capable of sequestering polyamide dyestuffs at low temperatures; 0.0045 to 0.06 grams/liter of said bath of an organic sulfur-containing compound having a reducing activity; and 0.25 to 1.0 grams/liter of said bath of a detergent and dispersing agent capable of maintaining the aqueous bath in an homogeneous condition;

contacting said polyamide textile material with said aqueous bath at a neutral or slightly basic pH and at approximately room temperature;

heating said aqueous bath at a rate between 0.5°C. and 4°C. per minute to an intermediate selected temperature to effect temporary fixation of the anionic leveling agents on the dye active sites of said polyamide textile material;

adding at least one acid or soluble or dispersed metalliferous dyestuff normally used for dyeing polyamides to said aqueous bath, said dyestuff becoming sequestered at said temperature by the weak cationic complexing agent;

gradually heating said aqueous bath from said intermediate temperature to a dyeing temperature no greater than 130°C. at a rate between 0.5°C. and 4°C. per minute, said increasing temperature serving to destroy the complex which retains the dyestuff and also serving to de-fix the anionic leveling agents from the dye active sites on the polyamide textile material;

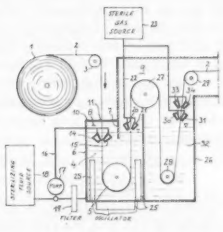
lowering the pH of the aqueous bath to between 3 and 7 and maintaining said elevated dyeing temperature and said pH for about 15 to 60 minutes; and

removing the dyed textile material.

3,929,409
APPARATUS FOR THE STERILIZATION OF PACKAGING MATERIAL

Norbert Buchner, Tamm; Dieter Liede, Moglingen; Peter Schmeer, Bietigheim, and Günther Vögele, Schonaich, all of Germany, assignors to Robert Bosch Verpackungsmaschinen G.m.b.H., Waiblingen, Germany

Filed Sept. 12, 1973, Ser. No. 396,528
Int. Cl.[2] A61L *3/00*; **B08B** *3/12, 3/08, 1/02*
U.S. Cl. 21—91 **8 Claims**



1. In an apparatus for the sterilization of packaging material of the type including a container containing sterilizing liquid constituting a sterilizing bath through which the packaging material is drawn and guided, said container defining an entry portion and an exit portion, guide means for guiding the packaging material through the bath, said guide means including at least two elements which engage the packaging material while it is being drawn through the bath, one of the elements being disposed within the bath and the other of the elements being disposed outside of the bath, said other of the elements serving to guide the packaging material into the bath, a device for loosening any contaminants adhering to the packaging material and a drying installation disposed subsequent to the sterilizing bath, the improvement comprising:

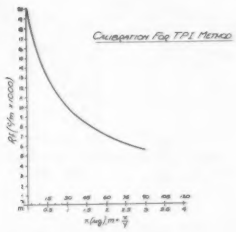
a. liquid scouring means serving as said loosening device including at least one nozzle, adjacent to the packaging material adjacent to the entry portion of the container and located to spray a high velocity stream of sterilizing liquid at said packaging material during the passage thereof between said one of and the other of said elements so as to hit the packaging material over its entire width, for loosening the contaminants; and

b. gas scouring means serving as said drying installation including at least one nozzle disposed at a location adjacent the exit portion of the container through which a curtain of a sterile gas streams obliquely downward onto the packaging material at high velocity, for drying the packaging material.

3,929,410
ANALYTICAL PROCESS

Benjamin Schloss, 179 Sundridge Drive, North Tonawanda, N.Y. 14120

Continuation-in-part of Ser. No. 87,865, Nov. 9, 1970, abandoned. This application Oct. 9, 1973, Ser. No. 404,695
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 R **13 Claims**



1. A method for determining the amount of a substance in a gaseous, liquid or solid sample, that is available in two forms, form A and B, in which A and B are chemically identical but A possesses an internal property which B does not possess, so that A can be analytically distinguished from B which comprises:

equilibrating a known amount, Y, of the substance in form A with an unknown amount, X, of the substance in form B,

in which Y is chosen to be precisely equal to the amount of substance required to saturate a phase I at a temperature, T_s,

and in which X + Y is divided between two immiscible phases, phase I and phase II,

and by measuring the property which distinguishes A from B to obtain an initial value R_i for the amount Y,

then by determining R_f, the value for the amount of A that is present in phase I at T_s after equilibration with B and partitioning of X + Y between phases I and II and where Y amount of substance is in phase I,

the amount X can be calculated from the equation

$$X = Y\left(\frac{R_i}{R_f} - 1\right)$$

or by referring to a calibration curve of R_f vs. X.

3,929,411
SAMPLE TRANSFER DEVICE AND METHOD FOR ANALYTICAL SYSTEM

Nobuyoshi Takano, Katsuta; Kaoru Sakai, Hitachi; Satoshi Aoki, and Kazuo Yasuda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 28, 1973, Ser. No. 392,294
Claims priority, application Japan, Sept. 14, 1972, 47-91731
Int. Cl.[2] G01N *1/14*
U.S. Cl. 23—259 **14 Claims**

1. An apparatus for successively transferring a plurality of different liquid samples to a plurality of different treatment stations in an analytical system comprising:

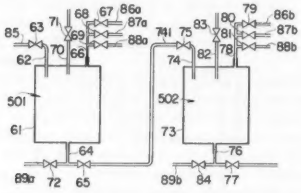
a first treatment unit including a first enclosed vessel, a sample inlet connected to an upper part of said first vessel and a first valve connected to said sample inlet;

a second treatment unit including a second enclosed vessel, a sample outlet connected to the lowermost portion of said second vessel and a second valve connected to said sample outlet;

first conduit means fluidly communicating the lowermost portion of said first vessel with an upper portion of said second vessel;

a third valve connected to said first conduit means;

sources of gasses at an increased pressure, reduced pressure and atmospheric pressure fluidly communicating with upper portions of said first and second vessesl through respective valves; and



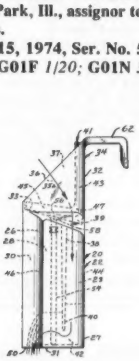
control means for controlling the gas sources so that a pressure differential is maintained between the interiors of said first vessel and said second vessel for transferring a sample in said first vessel to said second vessel, said control means maintaining a pressure differential between the interiors of said first vessel and said second vessel after all of the sample is transferred from said first vessel to said second vessel so that sample deposited on the walls of said conduit means is blown away cleanly by a jet of gas, said control means thereafter causing another sample to be introduced into said first treatment station.

3,929,412

LIQUID RECEIVING DEVICE

Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Nov. 15, 1974, Ser. No. 524,023
Int. Cl.² G01F *1/20*; G01N *33/16*
U.S. Cl. 23—259 **14 Claims**



1. A self-administratable device to measure a discharge of urine, comprising:

a movable receptacle having a chamber, port means adjacent an upper end of the receptacle and being positionable adjacent the point of discharge to receive the discharge for passage of the discharge into the chamber, and means associated with said chamber for measuring a dynamic characteristic of the urine discharge; and

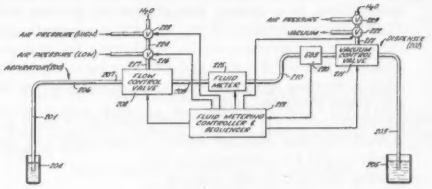
porous means intermediate the port means and chamber said porous means being sufficiently porous to permit an even flow of the discharge through the porous means without impairment of the measuring capabilities of the measuring means, and said porous means being sufficiently thick and closed to break up the discharge and prevent splashing of the discharge against the user.

3,929,413

FLUID TRANSPORT AND METERING SYSTEM

Robert R. Young, Anaheim; Patrick L. Randleman, Brea, and Arthur B. Stolins, Newport Beach, all of Calif., assignors to Anatronics Corporation, Anaheim, Calif.

Filed Mar. 4, 1974, Ser. No. 447,959
Int. Cl.² G01N *1/14*
U.S. Cl. 23—259 **17 Claims**



1. In an automated apparatus for performing chemical analysis including a fluid transport system for transporting fluid from an aspirator to a dispenser through a fluid conduit, the improvements comprising:

said fluid conduit being continuous and of non-varying internal volume while the fluid is being transported therethrough;

means proximate said dispenser for supplying a substantially constant vacuum to said fluid downstream of said aspirator;

metering detector means for detecting passage of the fluid meniscus at a predetermined location along said conduit; flow control means downstream of said aspirator and responsive to said metering detector for interrupting the flow of fluid upstream of said metering detector so that a slug of fluid is entrapped in said conduit between said flow control means and said metering detector; and

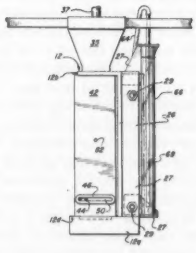
means for automatically supplying gas under pressure to the trailing meniscus of said fluid slug for moving said fluid slug through said conduit.

3,929,414

BLOOD OXYGENATOR UTILIZING A REMOVABLE MEMBRANE OXYGENATOR UNIT

Ronald J. Leonard, Elk Grove Village, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Jan. 21, 1974, Ser. No. 435,143
Int. Cl.² A61M *1/03*
U.S. Cl. 23—258.5 **10 Claims**



1. In a blood oxygenator unit which defines a first plurality of blood flow channels and a second plurality of oxygen flow channels in interleaving relation to said first flow channels, said first and second flow channels being separated by a semipermeable membrane, and an outer casing enclosing said

membrane and said flow channels, said outer casing having separate blood and oxygen inlets and outlets, the improvement wherein said oxygen inlet comprises a transversely elongated port defined in said casing, positioned to directly expose one end of all of said plurality of said second flow channels to the exterior of said casing, whereby simple connection of said second flow channels to an oxygen line is prevented.

2. The blood oxygenator unit of claim 1 in which said semipermeable membrane is a porous, hydrophobic material capable of preventing the passage of blood while permitting the passage of oxygen and carbon dioxide therethrough.

3,929,415
ε-ALUMINUM FLUORIDE BY EVAPORATING AQUEOUS MF SOLUTION OF ALF_3 UNDER VACUUM TO DRYNESS AND HEATING

Hiroyuki Wada, Mukomachi; Yasumasa Kawakami, Sakai, and Tutomu Kamihigoshi, Takatsuki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Continuation of Ser. No. 156,536, June 24, 1971, abandoned, which is a continuation of Ser. No. 770,337, Oct. 24, 1968, abandoned. This application July 22, 1974, Ser. No. 490,916

Claims priority, application Japan, Oct. 26, 1967, 42-68911; Oct. 26, 1967, 42-68912

Int. Cl.² B01D *9/02;* **C01F** *7/50*

U.S. Cl. 23—305 **7 Claims**

1. A method for preparing ε-aluminum fluoride, characterized by an X-ray diffraction pattern with peaks at angles of diffraction of 8.1° (very strong), 18.8° (strong), 24.8° (very strong), 26.4° (strong), 28.1° (strong) and 50.8° (strong) with spacings in A of 10.915A, 4.719A, 3.590A, 3.370A, 3.175A and 1.797A, respectively, for each angle noted, and having the empirical formula $AlF_3.1.5\ H_2O$, which comprises evaporating under vacuum an aqueous hydrofluoric acid solution of aluminum fluoride to dryness at a temperature from 30° to 120°C and heating the resulting product of the evaporation to a temperature of from above 120° to 500°C.

3,929,416
PROCESS AND APPARATUS FOR PRODUCING GYPSUM LUMPS

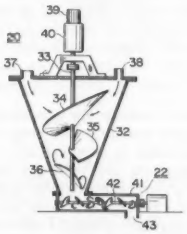
Hirobumi Tanaka, Sendai; Norio Arashi, Hitachi; Yukio Hishinuma, Hitachi, and Zensuke Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 8, 1973, Ser. No. 358,335

Claims priority, application Japan, May 10, 1972, 47-45471

Int. Cl.² B01F *7/16, 15/00;* **B28C** *1/22;* **C01F** *11/46*

U.S. Cl. 23—260 **20 Claims**



1. An apparatus for producing solidified gypsum lumps comprising an inverted conical reactor having an inlet in an upper portion thereof for supplying sulfuric acid and limestone and an outlet at a lower portion thereof, discharging means arranged at the outlet of said reactor for conveying gypsum lumps produced in said reactor, a rotating shaft vertically disposed in said reactor, and a plurality of sector blades arranged in a staggered relationship around said rotating shaft, each blade being arranged at an inclined angle with respect to the axis of said rotating shaft, the outer peripheries of the sector blades extending to near the inner surface of said inverted conical reactor.

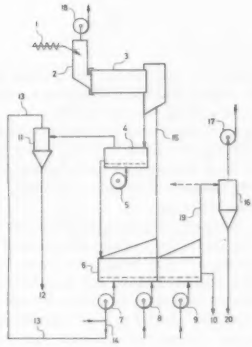
3,929,417
APPARATUS FOR THE MANUFACTURE OF POWDERED LIME

Josef Rosa, Drasov u Brno, and Vlastimil Petr, Brno, both of Czechoslovakia, assignors to Vyskumny ustav stavebnich hmot, Brno, Czechoslovakia

Division of Ser. No. 381,067, July 20, 1973, abandoned. This application July 1, 1974, Ser. No. 484,571

Int. Cl.² C01F *11/06;* **B07B** *9/02;* **B01J** *6/00*

U.S. Cl. 23—262 **2 Claims**

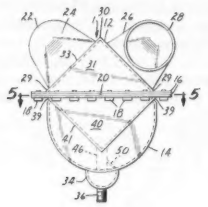


1. An apparatus for the manufacture of lime of substantially uniform activity comprising a rotary kiln with a downward inclination of about 0.5 to about 2.5 percent, a heat exchanger in front of said kiln, means for feeding ground limestone to the upper end of the rotary kiln through said heat exchanger, at least one fluid classifying cell connected to the outlet of the kiln, said fluid classifying cell having a particle support grate, at least two outlets, a first separator at one outlet of said fluid classifying cell, a fluid cooling device at another output thereof, said fluid cooling device having a particle support grate, comprising at least two sections in series provided with separators, fan means supplying cooling air to said fluid classifying cell and to each section of the fluid cooling device below the grates thereof respectively, a burner extending into the lower end of the kiln a distance from two to four times of the diameter of the kiln, said means for feeding comprising means for supplying ground limestone having a grain size of up to about 2 mm with a residue on a 2mm sieve below about 40 percent to the upper part of the kiln by way of the heat exchanger, means for feeding the burnt lime from said kiln to the fluid classifying cell, said fluid classifying cell separating at least one fraction of a grain size below about 600 microns for feeding to said one outlet thereof, means for feeding the remaining fractions to said fluid cooling device, said first separator separating said fraction from air from said fluid classifying cell as the first part of the product of said apparatus, a first conduit connecting the upper part of the first up to the last but one section of the fluid cooling device with the rotary kiln, a second separator, a second conduit connecting the upper part of the last section of said cooling device with said second separator, the air outlet from said first separator being connected by way of an air mixer with the fan means to the first section of said fluid cooling device below the grate thereof.

3,929,418
DUAL CROSS-FLOW CANISTER

Vernon E. Wood, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1973, Ser. No. 393,337
Int. Cl.² B01J *35/04*; F01N *3/15*
U.S. Cl. 23—288 FB **2 Claims**



1. A container or canister for connection into the exhaust stream of an engine and for positioning a catalyst support in said stream comprising, in combination,

I. a casing containing and holding a catalyst support, said casing having two parts, a cover and a base, said cover and said base mating and being joined at respective peripherally flanged rectangular openings,

A. said base having

1. a rounded bottom with extended sides extended toward a first pair of opposite sides of the rectangular opening of said base, said base having generally semicircularly shaped end members attached to said rounded bottom with extended side walls extended toward the second pair of opposite sides of the rectangular opening of said base, said rounded bottom, said end members and said extended sides forming a plenum space, the portion of the extended sides of the rounded bottom adjacent to said first pair of opposite sides of said peripherally flanged opening being shaped to provide lower cross rails;

2. said end members comprising right-triangular support frames, said support frames having equal sides meeting at a right angle, said right angle being located near the rounded bottom of said base, the hypotenuses of said support frames forming the top edges of said end members which hypotenuses are the second pair of opposite sides of the rectangular opening of said base and the equal sides of said support frames forming side rails;

3. an air inlet manifold and air inlets along the rounded bottom of said base at its deepest part for admitting air into the said plenum space and

4. an angle support member above said air inlets connecting the right angles of said support frames;

B. said cover having

1. right triangular end pieces having the right angle at the apex, the hypotenuses mating with the triangular support frames of the end members of the base and having equal sides;

2. a ridge connecting the right angles of said right-triangular end pieces and forming an internal angle therebetween;

3. cross rails connecting the acute angles of said triangular end pieces and

4. side rails along the sides of said triangular end pieces between said ridge and said cross rails,

5. first manifolding means parallel to and along one side of said ridge and lengthwise of said cover connecting to said ridge, side rails and cross rail with inlet port for inlet of said exhaust stream at one end and

6. second manifolding means parallel to and along the other side of said ridge connecting to said ridge, side rails and cross rail lengthwise of said cover with outlet port facing in the opposite direction to said inlet port for release of said exhaust stream, the centerlines of said inlet and outlet ports being offset from one another,

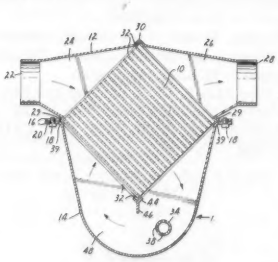
II. said container or canister further comprising a dual cross-flow refractory ceramic catalyst support of parallel-epipedal form with longitudinal axis and square cross-section having passageways at right angles to the said longitudinal axis, said passageways being in approximately equal groups and said groups being mutually at right angles to each other, said catalyst support having catalyst thereon and being positioned within said casing with its square ends resting in the right-triangular support frames of the end members of said base with its longitudinal axis parallel to the first pair of opposite sides of the rectangular opening in said base, one longitudinal edge of said catalyst support being supported free from the outer wall of the base of said casing in the angle support member thereof, two opposite longitudinal edges being supported at the sides of said base in the lower cross rails along each side of said base and the fourth longitudinal edge and the ends being engaged and urged into position by said ridge, said side rails and said cross rails of said cover, with said first and second manifolding means securely positioned above adjacent faces of said catalyst support, and

III. said container or canister further comprising resilient mounting material between said catalyst support and the said ridge, said cross rails and said side rails of said cover of said canister at all lines of contact therebetween thereby preventing blowby of gases in said exhaust stream.

3,929,419
DUAL CROSS-FLOW CANISTER AND PROCESS

Harvey A. Chapman, Richfield, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1973, Ser. No. 393,338
Int. Cl.² B01J *35/04*; F01N *3/15*
U.S. Cl. 23—288 FB **2 Claims**



1. A container or canister for connection into the exhaust stream of an engine and for positioning a catalyst support in said stream comprising, in combination,

I. a casing containing and holding a catalyst support, said casing having two parts, a cover and a base, said cover and said base mating and being joined at peripherally flanged rectangular openings,

A. said base having

1. a rounded bottom, approximately paraboloid end members and extended side walls, said side walls diverging toward a first pair of opposite sides of the rectangular opening of said base,

2. said approximately paraboloid end members comprising right-triangular support frames, said triangular support frames having equal sides meeting at a right angle, said right angle being located near the rounded bottom of the base, the hypotenuses of said triangular support frames forming the top edges of

said end members which hypotenuses also form the second pair of opposite sides of the rectangular opening of said base and the equal sides of said support frames forming side rails, and said end members, said rounded bottom and said side walls forming a plenum space,

3. a vane between said end members below the right angles of the triangular support frames,

4. said base further having an air inlet inserted through one said end member below the triangular support frame into the said plenum space.

B. said cover having

1. right-triangular end pieces having the right angle at the apex, the hypotenuses of said triangular end pieces mating with the triangular support frames of the said paraboloid end members of said base,

2. a ridge connecting the right angles of said right-triangular end pieces and forming an internal angle therebetween;

3. cross-rails connecting the acute angles of said triangular end pieces and

4. side rails along the sides of said triangular end pieces between said ridge and said cross rails,

5. an inlet manifold connecting to said ridge, side rails and cross rail at one side of said ridge and inlet port for inlet of said exhaust stream in said inlet manifold,

6. outlet manifold connecting to said ridge, side rails and cross rail at the other side of said ridge and outlet port in said outlet manifold for release of said exhaust stream from said outlet manifold with outlet port facing in the opposite direction to said inlet port and the two said ports being on substantially the same centerline,

II. said container or canister further comprising a dual cross-flow refractory ceramic catalyst support of parallel-epipedal form with longitudinal axis and square cross-section having all passageways at right angles to the said longitudinal axis, said passageways being in two directions mutually at right angles to each other, said catalyst support having catalyst thereon and being positioned within said casing with its square ends resting in the triangular support frames of said paraboloid end members of said base, its longitudinal axis parallel to the side walls of said base, a first longitudinal edge being positioned above said vane connecting said end members of said casing, two opposite longitudinal edges being supported at the sides of said base and the fourth longitudinal edge and the ends being engaged and urged into position by said ridge, said side rails and said cross rails of said cover with inlet and outlet manifolds securely positioned above adjacent faces of said catalyst support, and

III. said container or canister further comprising resilient mounting material between said catalyst support and the said ridge, said cross rails and said side rails of said cover of said canister at all lines of contact therebetween thereby preventing blowby of gases in said exhaust stream.

3,929,420

DUAL CROSS-FLOW CANISTER

William P. Wood, Marine, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1973, Ser. No. 393,339

Int. Cl.[2] B01J *35/04;* **F01N** *3/15*

U.S. Cl. 23—288 FB **2 Claims**

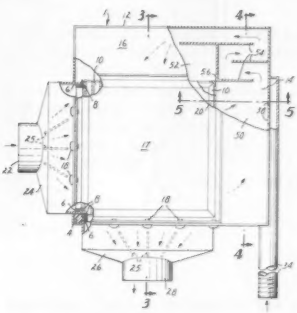
1. A container or canister for dual cross-flow catalyst-support comprising, in combination,

I. a casing of generally parallelepipedal shape with a square outline having square top and bottom and an outer wall of four rectangular sides and means securing said top and bottom to said outer wall,

A. two of said sides having a common corner therebetween and having equal rectangular openings therein adjacent said common corner and one other of said sides having openings for air inlets and having an air manifold over said openings externally of said casing,

B. said top and bottom of said casing being dished outward,

C. said casing containing and holding a refractory ceramic square dual cross-flow catalyst support with ends mating the dishing in said top and bottom and positioned within said casing with pads of intumescent sheet material between said catalyst support and said top and bottom and with two faces of said catalyst support having a first common corner therebetween at the rectangular openings in the said two sides of said casing and two other faces of said catalyst support having a second common corner therebetween, one of said two other faces facing into a first plenum into which said air inlets open and the other into a second plenum,



D. baffles in said casing adjacent said second common corner of said catalyst support providing a labyrinthine connection between said first plenum and said second plenum for mixing gases entering said first plenum with air from said air inlets,

E. an inlet manifold with inlet port in one of said rectangular openings opposite the said side having openings for air inlets and urged against said catalyst support and

F. an outlet manifold with outlet port in the other of said rectangular openings urged against said catalyst support,

G. means sealing between said two rectangular openings preventing blowby between said inlet and outlet manifolds, gaskets between said manifolds and said catalyst support and means attaching said manifolds in their respective rectangular openings.

3,929,421

TUBULAR CATALYTIC REACTOR WITH PREMIXING MEANS FOR MULTIPLE REACTANTS OF DIFFERENT DENSITIES

Darrell L. Werges, Park Forest, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,064

Int. Cl.[2] B01J *3/04, 8/02, 8/06;* **C07C** *103/00*

U.S. Cl. 23—288 M **6 Claims**

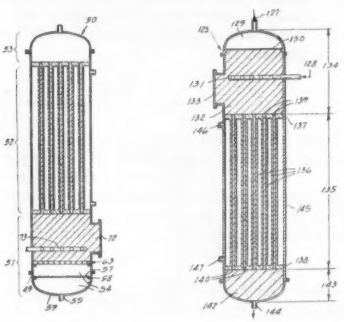
1. Apparatus adapted for reacting under strongly exothermic or endothermic conditions two at least partially immiscible fluids of differing density at least one of which is in a liquid phase comprising:

A. a plurality of substantially similar tubular members in laterally spaced relationship to each other, including tube connected mounting tube sheet means therefor at respective opposed ends of said tubular members, said tubular members each containing a particulate catalyst material comprising a catalyst bed,

B. a shell means generally enclosing wall portions of said tubular members in fluid tight relationship and including inlet and outlet means for circulation of a heat exchange fluid therethrough,

C. first housing means at one end of said tubular members and defining in combination with one of said tube sheet means a first fluid tight common chamber for end entrance openings of each of said tubular members,

D. second housing means at the opposite end of said tubular members and defining in combination with a second of said tube sheet means a second fluid tight common chamber for opposite end exit openings of each of said tubular members, and including an exit port means defined therein,



E. a bed of substantially inert particulate material positioned within said first common chamber, one end of said bed of inert particulate material being in adjacent relationship to said end entrance openings,

F. retention means maintaining said bed of inert particulate material in such relationship,

G. first injection means including first input port means defined in said first housing means and adapted to input a first fluid into said bed of inert particulate material, said first injection means including a conduit distribution network having a plurality of orifices therein, the location of said orifices being within said bed of inert particulate material and being positioned to permit said first fluid to escape therefrom in said bed of inert particulate material and be generally evenly distributed transversely across said first common chamber,

H. second injection means including second input port means defined in said first housing means and adapted to input a second fluid into said bed of inert particulate material said second injection means being located in said first common chamber further from said end entrance openings than said first injection means,

I. the interrelationship between said bed of inert particulate material, said first injection means, and said second injecton means being such that

1. in the region of said bed of inert particulate material between said second injection means and said end entrance openings the said respective two fluids are generally uniformly intermixed transversely across said first common chamber adjacent said end entrance openings,

2. such resulting intermixture flows at a substantially uniform rate transversely across said first common chamber adjacent said end entrance openings,

3. such resulting intermixture flows at a substantially uniform rate into substantially all of each of said end entrance openings,

4. the ratio of said one fluid to said other fluid in substantially all of said end entrance openings being substantially the same.

3,929,422

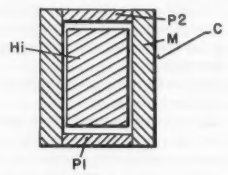
MEANS FOR RECOMBINING HYDROGEN AND OXYGEN IN A SEALED BATTERY AND CONTROLLING RECOMBINATION AT CATALYST SURFACES

Ekkehard L. Kreidl, Wayland, and Douglas Shooter, Winchester, both of Mass., assignors to Koehler Manufacturing Company, Marlborough, Mass.

Continuation of Ser. No. 77,691, Oct. 2, 1971, abandoned, Division of Ser. No. 866,531, Oct. 15, 1969, Pat. No. 3,630,778. This application July 22, 1974, Ser. No. 490,715

Int. Cl.² B01J *35/10*

U.S. Cl. 23—288 R **1 Claim**



1. A self-limiting composite catalyst device for recombining hydrogen and oxygen with exothermic heating in a sealed battery chamber in which hydrogen and oxygen are evolved and exert increased pressure, said catalyst device including a nucleus of enclosed catalyst consisting in a catalyst-supporting body of alumina and a catalyst metal of palladium having a relatively high-level gas-recombining capability contained on the catalyst-supporting body, and a foraminous outer cylindrical enclosure member which defines an enclosed space in which gases may be received and held in contact with the nucleus, said enclosure member having exposed surfaces of relatively low-level gas-recombining capability through which hydrogen and oxygen gases may pass into contact with the nucleus and said exposed surfaces consisting in a catalyst supporting material having contained therein a quantity of catalyst metal capable of undergoing heating in a range of exothermic heating which is limited in response to increase in pressure in the sealed battery chamber and which lies within limits of from 400° C to 600° C, and said quantity of catalytic metal in the exposed surfaces occurring in amounts of from about 0.01% up to 0.1% by weight, and said outer catalyst supporting material having an internal surface area occurring between 0.3 square meters per gram up to a value of less than 1 square meter per gram, and said catalyst metal of relatively high-level gas-recombining capability in the nucleus occurring in a quantity of not less than 2% of catalyst metal, and said catalyst supporting body in the nucleus having a surface area of more than 50 square meters per gram.

3,929,423

HOT WORK FORGING DIE BLOCK AND METHOD OF MANUFACTURE THEREOF

Charles W. Finkl, Evanston, Ill., assignor to A. Finkl & Sons Company, Chicago, Ill.

Filed May 9, 1973, Ser. No. 358,827

Int. Cl.² B22F *9/00*; **C22C** *38/40*, *33/00*

U.S. Cl. 29—180 **12 Claims**

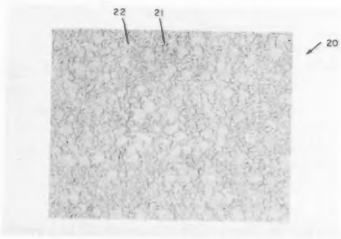
11. A forged, low alloy, hot work, steel die block, said forged steel die block being characterized by a low non-metallic inclusion content, including silicates and aluminates, high machinability in all conditions including final hardened condition, and substantially uniform through hardness in heavy sections, said steel die block consisting of the following composition by weight percent:

C	from about	.53	to a maximum of about .57
Mn	from about	.75	to a maximum of about .95
S	from about	.035	aim
P		.020	max.
Si	from about	.20	to a maximum of about .35
Ni	from about	.85	to a maximum of about 1.05
Cr	from about	.85	to a maximum of about 1.15
Mo	from about	.36	to a maximum of about .43
V		.05	aim
Al	less than	.005	
Fe	Balance, together with residual, non-deleterious elements		
O_2	30 ppm max.		
H_2	2.2 ppm max.		

3,929,424
INFILTRATION OF REFRACTORY METAL BASE MATERIALS

Richard H. Krock, Weston, and Jerome J. Pickett, Bedford, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 23, 1973, Ser. No. 408,606
Int. Cl.² B22F *1/00*
U.S. Cl. 29—182.1 **9 Claims**



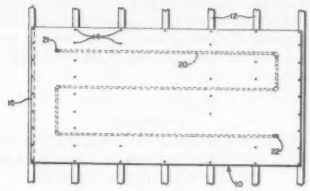
1. A body including refractory metal containing particles and a metal containing matrix, the refractory metal containing particles having an average particle size substantially equal to the average particle size of the refractory metal containing particles prior to the formation of the body, the body comprising as major weight constituent, refractory metal containing particles, the refractory metal selected from the group consisting of tantalum, molybdenum and tungsten and as the minor weight constituent, a metal containing matrix including a refractory metal selected from the group consisting of tantalum, molybdenum and tungsten and a metal selected from the group consisting of Ni, Fe, Co, Cu, Cr and combinations thereof.

3,929,425
FOAMED METAL BODIES

Alex R. Valdo, Phoenix, Ariz., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 335,680, Feb. 26, 1973, Pat. No. 3,848,666, which is a continuation-in-part of Ser. Nos. 91,211, Nov. 19, 1970, abandoned, and Ser. No. 91,212, Nov. 19, 1970, abandoned. This application Mar. 29, 1974, Ser. No. 456,031. The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.
Int. Cl.² B32B *15/20*
U.S. Cl. 29—191 **6 Claims**

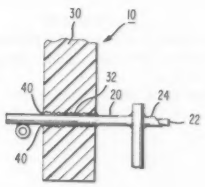
1. A rectangular structural panel of foamed aluminum having discrete cells therein, having a density less than about 50 pounds per cubic foot and having embedded therein a tubular conduit for a heating liquid, said conduit being a material having a higher melting point than that of the foamed aluminum, said conduit having an inlet and an outlet end, and both of said ends projecting out through one face of the panel.



3,929,426
METHOD OF ANCHORING METALLIC COATED LEADS TO CERAMIC BODIES AND LEAD-CERAMIC BODIES FORMED THEREBY

Henry Leo Blust, Marion, Ind.; Norman Lee Lindburg, Berkeley Heights, and Dale Vernon Henry, Union, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,098
Int. Cl.² B32B *15/04*
U.S. Cl. 29—195 **3 Claims**



1. An integral ceramic-lead body comprising:
a. a fired ceramic body;
b. an opening within said body having an interior surface with irregularities;
c. a lead anchored within said opening, said lead including a core material of a first metallic composition and a plated surface of a second metallic composition, the melting temperature of which is lower than that of said first metallic composition; said first metallic composition being wettable by said second metallic composition; said interior surface being substantially non-wettable by said second metallic composition; and
d. means for mechanical retention of said lead within said opening comprising primarily a casting of said second metallic composition within said irregularities of said interior surface.

3,929,427
WEAR-RESISTANT SURFACE COMPOSITE MATERIALS AND METHOD FOR PRODUCING SAME

Peshotan S. Kotval, Hartsdale; Henri Hatwell, White Plains, and Frank P. Gortsema, Croton, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 270,241, July 10, 1972, abandoned. This application May 4, 1973, Ser. No. 357,080
Int. Cl.² B32B *15/04*
U.S. Cl. 29—195 **11 Claims**

1. An improved wear-resistant surface composite material, the surface of which has a duplex composite structure comprised of (a) a matrix material of poor wear-resistance and (b) not less than about 50 percent area fraction and up to about 90 percent area fraction of a hard fibrous monocarbide phase,

said monocarbide phase being represented by the general formula MC wherein M is a metal selected from the group consisting of tantalum, titanium or tungsten and C is carbon, said monocarbide phase being in the form of filaments between 2 and about 15 microns in diameter and being present at the composite surface as sections of varying orientations, the remainder of the surface being comprised of the matrix of the said material.

3,929,428

WEARING MEMBER HAVING A PAD-WELDED SURFACE LAYER HIGH IN WEAR-RESISTANCE AND HEAT CRACK-RESISTANCE

Takeshi Nishi; Tsurugi Kimura; Isao Moriguchi; Kiyoshi Yokoi, all of Kitakyushu; Isojiro Nakakobo, Tokyo, and Ryohei Kumagai, Narashino, all of Japan, assignors to Yawata Iron & Steel Co., Ltd.; Yawata Welding Electrode Co., Ltd. and Nippon Hard Facing Co., Ltd., all of, Japan

Continuation of Ser. No. 727,034, May 6, 1968, abandoned. This application Feb. 8, 1971, Ser. No. 113,771

Claims priority application Japan, May 9, 1967, 42-29377

Int. Cl.[2] B32B *15/15*

U.S. Cl. 29—196.1 **13 Claims**

1. A roller for hot rolling operations comprising an alloy layer welded to a steel substrate, said alloy consisting essentially of 0.1 to 0.5% C, 0.1 to 1.3% Si, 0.3 to 2.0% Mn, 1.0 to 5.0% Cr, 0.5 to 5.0% Mo and 0.5 to 3.0% V, the remainder being Fe.

JDM

3,929,429

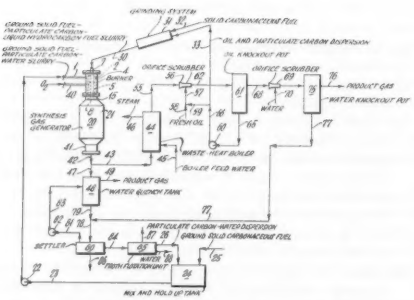
FUEL GAS FROM SOLID CARBONACEOUS FUELS

William B. Crouch, Whittier, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 26, 1974, Ser. No. 509,375

Int. Cl.[2] C01B *2/14*; **C10J** *3/16*

U.S. Cl. 48—201 **6 Claims**



1. In the continuous manufacture of gaseous mixtures principally comprising H_2 and CO, and optionally containing at least one member of the group CO_2, H_2O, CH_4, N_2, A, COS, and H_2S by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas in the presence of a temperature moderator in a reaction zone free from packing and catalyst of a free-flow gas generator, the improvement which comprises introducing into said reaction zone a continuous first slurry feedstream comprising a ground solid carbonaceous fuel and a liquid hydrocarbon fuel at a velocity in the range of about 1 to 500 feet per second; simultaneously introducing into said reaction zone so as to contact said first slurry feedstream a continuous separate second slurry feedstream comprising a ground solid carbonaceous fuel and water at a velocity in the range of about 1 to 500 feet per second; simultaneously introducing into said reaction zone a continuous separate third stream comprising a free-oxygen containing gas interposed between said first and second slurry feedstreams; and contacting and mixing said three streams together to form an atomized dispersion in which the ratio of atoms of oxygen to atoms of carbon in the total fuel is in the range of about 0.6 to 1.6, the weight ratio of H_2O to fuel is in the range of about 0.10 to 1.3, and the weight ratio of total solid carbonaceous fuel to liquid hydrocarbon fuel is in the range of about 0.8 to 12, and reacting said atomized dispersion in said reaction zone at a temperature in the range of about 1,500° to 3,500°F., and a pressure in the range of about 1 to 250 atmospheres.

3,929,430

PROCESS FOR MAKING SYNTHETIC FUEL GAS FROM CRUDE OIL

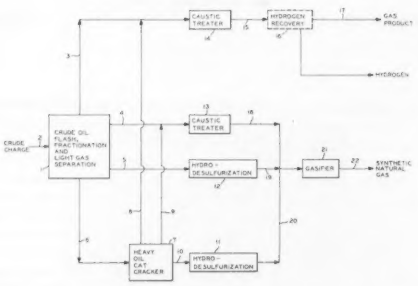
Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 14, 1973, Ser. No. 359,791

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] C10G *37/10*, *11/28*

U.S. Cl. 48—211 **5 Claims**



1. A process for the conversion of a crude oil to a synthetic natural gas which comprises separating the crude oil into a first fraction containing ethane and lighter gases, a second fraction containing propane and butane, a third fraction which is normally liquid and will contain hydrocarbons boiling up to about 400°F and a fourth residual fraction comprising topped crude oil; treating said first and second fractions to remove sulfur therefrom as sulfur or sulfur compounds; hydrodesulfurizing said third fraction and catalytically cracking substantially to extinction said fourth fraction to obtain a lower boiling product which product is then hydrodesulfurized, thereafter combining at least two of the last three fractions to form a charge stock for a synthetic natural gas producing operation and catalytically converting said charge stock to form a synthetic natural gas.

ANW
AWF

3,929,431

CATALYTIC REFORMING PROCESS

Kwang K. Koh, Seabrook, Tex.; Robert E. Pennington, Lonnie W. Vernon, and Nicholas C. Nahas, all of Baytown, Tex., assignor to Exxon Research and Engineering Co., Linden, N.J.

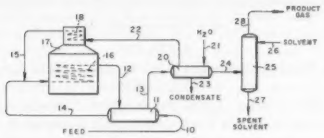
Continuation-in-part of Ser. No. 287,318, Sept. 8, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,680

Int. Cl.[2] C01B *2/14*

U.S. Cl. 48—214 **25 Claims**

1. A process for the production of a hydrogen-containing gas which comprises reacting a hydrocarbon feed stream consisting essentially of constituents boiling below about 450° F. with steam in a steam reforming zone and in the presence of a carbon-alkali metal catalyst at a temperature between about 1200° and about 1700° F. and at a pressure between about atmospheric and about 5000 psig, said catalyst being

prepared by heating an intimate mixture of carbonaceous solids and an alkali metal constituent to a temperature in excess of about 800° F., and recovering a hydrogen-containing gas from said steam reforming zone.

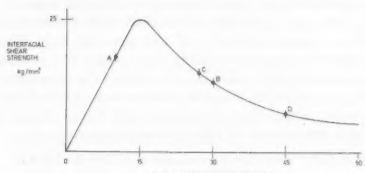


3,929,432

DIAMOND PARTICLE HAVING A COMPOSITE COATING OF TITANIUM AND A METAL LAYER

Robert John Caveney, Johannesburg, South Africa, assignor to De Beers Industrial Diamond Division Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 146,831, May 25, 1971, abandoned. This application Sept. 18, 1973, Ser. No. 398,383
Claims priority, application South Africa, May 29, 1970, 70/3653
Int. Cl.² B24D 3/06; C09C 1/68
U.S. Cl. 51—295 11 Claims



1. A diamond particle of the MD or SD type having a composite coating comprising a thin continuous layer of titanium adjacent the diamond surface, the titanium being present in an effective amount less than 3% by weight of the uncoated particle, said amount being effective to provide a continuous layer around the diamond particle, and a metal layer on the titanium layer, the metal of the metal layer being selected from the group consisting of iron, nickel, cobalt, copper and alloys containing one or more of these metals and being capable of forming an alloy with titanium under the influence of heat and being present in an amount of from 10 to 100% by weight of the uncoated particle, and the interface between the diamond and the titanium being essentially free of chemical bond formation.

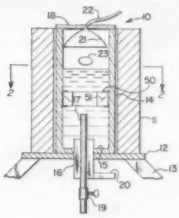
3,929,433

PROCESS AND APPARATUS FOR REMOVING IONS FROM FLUIDS

Ronald Ray Lucero, 1307 Monterey, Anaheim, Calif. 92801

Continuation-in-part of Ser. No. 150,599, June 7, 1971, Pat. No. 3,767,545. This application July 5, 1973, Ser. No. 376,295. The portion of this term of this patent subsequent to Oct. 23, 1990, has been disclaimed.
Int. Cl.² B03C 1/00; B01K 1/00
U.S. Cl. 55—3 9 Claims

1. In a process of removing like materials from gas, the steps of radiating into a gas electromagnetic energy of a wave length of increase the attraction of like materials in the magnetic field, inducing a vortex motion of the ionized particles to recycle the like materials, passing the radiated gas continuously through a substantially cylindrical magnetic field having a high magnetic field strength therethrough whereby like charged particles converge at a focal point within the magnetic field, and removing gas at the focal point of the charged particles whereby gas of higher like material concentration is separated from gas of lower like material concentration.

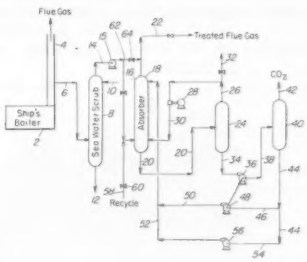


3,929,434

CORROSION REDUCTION OF TANKER VESSEL CARGO COMPARTMENTS

Earnest E. Nelson, Woodbury Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,274
Int. Cl.² B01D 53/14
U.S. Cl. 55—68 4 Claims



1. In a cargo vessel relying upon gaseous products of combustion to effect inerting of vessel compartments against explosion hazards, the improvement for reducing the corrosion of metal exposed to said inerting gas which comprises, reducing the carbon dioxide level of the inerting gas to less than 2 vol. percent.

3,929,435

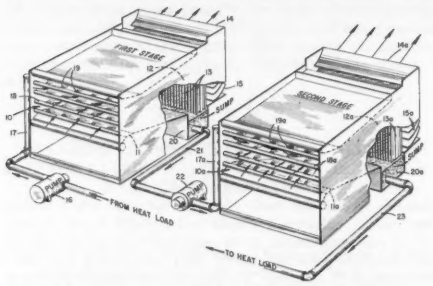
METHOD OF MULTI STAGE INJECTOR COOLING

John Engalitcheff, Jr., Gibson Island, Md., assignor to Baltimore Aircoil Company, Inc., Jessup, Md.

Continuation of Ser. No. 183,015, Sept. 23, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 449,781
Int. Cl.² B01D 47/06
U.S. Cl. 55—94 6 Claims

1. The method of extracting heat from a liquid that comprises spraying said liquid into a confined region having an end open to a source of first gas at a wet bulb temperature lower than that of the spray liquid, causing said spray to induce flow of said first gas from said source into said confined region for mixing and partial evaporation of said liquid, separating the so mixed first gas from said liquid and collecting the latter at a first temperature above the wet bulb temperature of the separated first gas, spraying said liquid into another confined region having an end open to a source of second gas at a wet bulb temperature no higher than that of the first gas at said first mentioned source, causing said spray to induce flow of said second gas from said source into said other confined region for mixing and partial evaporation of said liquid, sepa-

rating the second gas and liquid and collecting the liquid at a second temperature above the wet bulb temperature of the separated gas but below the wet bulb temperature of the



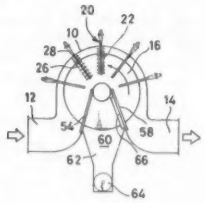
separated first gas, the combined total cross sectional area of both said confined regions being less than the cross sectional area of a single similar confined region capable of cooling said liquid to second temperature.

3,929,436

ROTARY ELECTROSTATIC PRECIPITATOR

Kenneth Kim, Tokyo, and Shigemutsu Suzuki, Urawa, both of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Sept. 13, 1973, Ser. No. 396,821
Claims priority, application Japan, July 4, 1973, 48-75417
Int. Cl.² B03C *3/10*
U.S. Cl. 55—121 **10 Claims**



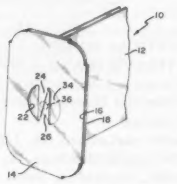
1. A rotary electrostatic precipitator comprising a housing provided with an inlet for receiving a dust laden gas stream under pressure and an outlet from which said gas stream issues substantially free of dust, an annular rotary dust collector means comprising a rotatable shaft having a plurality of disc electrodes mounted thereon within said housing and positioned in the path of the gas stream between said inlet and said outlet, said dust collector means rotating about a predetermined axis, a plurality of radially extending discharge means supported within said housing in spaced relation to said collector means and being adapted for connection together with the dust collector means to a source of electircal current for ionizing dust particles passing therebetween for collection by said dust collector means, first and second axially extending means at said inlet and said outlet ends of the precipitator, respectively, said first and second means being positioned with respect to said inlet and outlet ends and the discs of said annular dust collector means to direct said gaseous stream from said inlet through a first zone, through which said dust collector means rotates in proximate spaced relation to said discharge means, to said outlet, said first and second means also defining a dust removal zone which is liquid-free and isolated from said first dust collecting zone, said dust collecting means during rotation thereof rotating through said first dusting collecting zone and simultaneously through said dust removal zone, means on said second means in engagement with said dust collector means for removing dust from that part only of the dust collector means which passes through the dust removal zone, and conveyor means below the dust removal zone and in communication therewith for the conveying to waste dust from the dust removal zone, said dust from the dust removal zone freely falling onto the conveyor means.

3,929,437

SEAL FOR DISPOSABLE DUST BAGS FOR VACUUM CLEANERS

Paul Emile Gaudry, Laval des Rapides, Canada, assignor to Consolidated Foods Corporation, Old Greenwich, Conn.

Continuation-in-part of Ser. No. 434,057, Jan. 17, 1974, abandoned. This application Apr. 1, 1974, Ser. No. 457,084
Int. Cl.² B01D *46/02*
U.S. Cl. 55—367 **8 Claims**



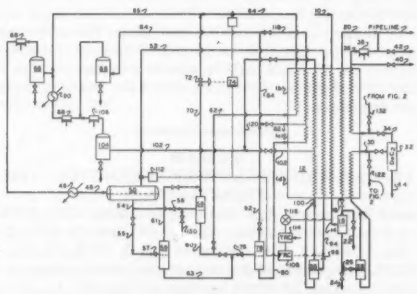
1. In a vacuum cleaner dust bag, a bag portion of air permeable and dust retaining material, a relatively stiff disc member secured to said bag portion and formed with an inlet opening into the bag portion, and a thin sheet of elastomeric material extending across said opening and formed with a normally small aperture located centrally of said opening, said disc including a pair of tongues extending side by side across said opening and covering said aperture, one end of the respective tongues being permanently integral with the remainder of the disc at opposite sides of said opening and being secured thereto at their other ends by frangible sections.

3,929,438

REFRIGERATION PROCESS

Ernest A. Harper, and Dunn M. Bailey, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 75,992, Sept. 28, 1970, Pat. No. 3,808,826. This application Mar. 4, 1974, Ser. No. 447,583
Int. Cl.² F25J *1/00*
U.S. Cl. 62—9 **1 Claim**



1. A process for recovering a mixture comprising ethane and propane from natural gas, which process comprises, in combination, the steps of:

a. cooling said natural gas partially to liquefy said natural gas;

b. distilling said partially liquefied natural gas from step (a) in a first distillation zone to recover an overhead stream comprising methane, ethane, and propane, and to recover

from a first reboiler zone of said first distillation zone a bottoms stream comprising some propane and higher boiling hydrocarbons;

c. partially condensing said overhead stream from step (b);

d. in a second distillation zone, distilling a feed, as obtained below, to recover from said second distillation zone an overhead steam comprising methane which overhead stream is then combined with said overhead stream from step (b) and passed to a common accumulator to form a mixture;

e. removing a steam comprising methane from said common accumulator zone;

f. returning a first portion of said accumulator mixture to said first distillation zone as reflux to the first distillation zone;

g. passing a second portion of said accumulator mixture controlled in accordance with the liquid level in said reboiler region of the second distillation zone to the second distillation zone as feed to said second distillation zone;

h. recovering a bottoms steam comprising ethane and propane, as a product of the process, from a second reboiler zone in said second distillation zone, said second reboiler zone heated by indirect heat exchange with liquid from said first reboiler zone said liquid flow controlled in accordance with the temperature in said second reboiler zone; and

i. controlling the amount of heat supplied to said first reboiler zone in accordance with the level in the common accumulator zone so as to maintain a desired level in said common accumulator zone.

3,929,439
METHOD FOR PREPARING A HIGHLY SILICEOUS ALKALI METAL SILICATE GLASS AND HYDRATED POWDER

Richard H. Pierce, Broomall, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Filed July 8, 1974, Ser. No. 486,558
Int. Cl.² C03B *19/08, 5/16, 31/00*
U.S. Cl. 65—22 **12 Claims**

1. A method of preparing hydrated alkali metal silicate powders having a SiO_2/M_2O mol ratio between 4.5/1.0 and 20/1.0, wherein M stands for an alkali metal, comprising:

a. preparing a mixture consisting essentially of:

1. 10 to 90% by weight alkali metal silicate solution having a mol ratio of SiO_2/M_2O between 1.6/1.0 and 4.0/1.0,

2. 15 to 85% by weight colloidal silica sol having a mol ratio of SiO_2/M_2O between 70/1.0 and 400/1.0 and a concentration of 15 to 50% SiO_2, and

3. 0 to 305 by weight water;

b. heating said mixture for a sufficient period of time to form a uniform colloidal solution; and

c. drying said uniform colloidal solution to form the powder.

6. A method of preparing uniform alkali metal silicate glass having a SiO_2/M_2O mol ratio between 4.5/1.0 and 20/1.0, wherein M stands for an alkali metal, comprising:

a. preparing a mixture consisting essentially of:

1. 10 to 90% by weight alkali metal silicate solution having a mol ratio of SiO_2/M_2O between 1.6/1.0 and 4.0/1.0,

2. 15 to 85% by weight colloidal silica sol having a mol ratio of SiO_2/M_2O between 70/1.0 and 400/1.0 and a concentration of 15 to 50% SiO_2, and

3. 0 to 30% by weight water;

b. heating said mixture for a sufficient period of time to form a uniform colloidal solution;

c. drying said uniform colloidal solution to a powder; and

d. fusing said powder at 1100° to 1400°C to form a uniform molten glass.

3,929,440
MANUFACTURE OF LASER GLASS

Lucy Florence Oldfield, Harrow Weald, England, assignor to The General Electric Company Limited, London, England

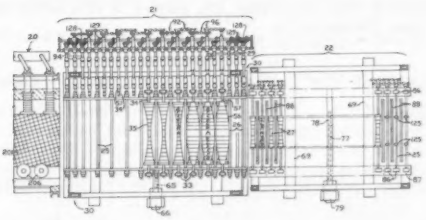
Filed Nov. 13, 1974, Ser. No. 523,513
Claims priority, application United Kingdom, Nov. 30, 1973, 55627/73
Int. Cl.² C03B *5/06*
U.S. Cl. 65—32 **8 Claims**

1. A method of manufacturing a laser glass, which includes the steps of melting a batch of glass-forming materials in a vessel at least the interior surface of which is formed of noble metal consisting at least mainly of platinum, bubbling helium gas through the melt for a sufficient length of time to remove any bubbles of gas formed during reaction of the batch, refining the melt by heating for at least 18 hours in the presence of a dry, oxygen-free gas stream consisting of at least one of the gases of the group consisting of neon, argon, krypton and xenon, said gas stream being caused to flow over the surface of the melt at sufficient velocity to effect flushing of the said surface, casting the refined melt in a mould preheated at least to the lower annealing temperature of the glass, and annealing the cast body of glass by cooling the said body from the upper annealing temperature of the glass to room temperature over a period of not less than 24 hours.

3,929,441
ROLL FORMING HEAT-SOFTENED GLASS SHEETS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 10, 1974, Ser. No. 487,332
Int. Cl.² C03B *23/02*
U.S. Cl. 65—106 **10 Claims**



1. An apparatus for forming shaped sheets of heat deformable materials comprising a conveyor means for conveying sheets along a normal path of movement defined by a longitudinally extending center line sequentially through a furnace for heating the sheets to a deformable state, a sheet forming station and a sheet cooling station, said furnace and said stations being in end to end relationship, said sheet forming station comprising opposed sets of forming rolls of complementary curvature for imparting a curvature to said deformable sheets aligned along a longitudinally extending common center line, said conveyor having shaped conveyor rolls in at least the initial portion of said sheet cooling station aligned along a longitudinally extending common center line, means for adjusting the transverse position of the center line common to said forming rolls relative to the center line of the normal path of movement of the conveyor, and means for adjusting the transverse position of the center line common to the shaped conveyor rolls in said initial portion of said cooling station where the sheet is at an elevated temperature such that it is subject to distortion upon contact with a solid surface whereby the rolls in the sheet forming and cooling stations may be offset laterally with respect to the normal path of movement of the sheets in an amount sufficient to modify the curvature of portions of the sheets disposed outwardly of the center line of the longitudinally extending path of movement of the sheets.

2. In the method of shaping sheets of heat-softenable material by roll forming wherein a series of heat softened sheets is conveyed along a predetermined path in a forming station having a longitudinally extending center line and each sheet of said series in turn is moved continuously between a pair of sets of forming rolls rotating about axes transverse to said path, each set comprising a series of rotating forming rolls spaced longitudinally along said path and being aligned along a longitudinally extending center line common to said sets of forming rolls, and adapted to engage one or the other major surfaces of said sheet and each roll in one of said sets corresponding to a roll of complementary curvature in the other of said sets, and providing said sets with relative motion toward one another while said sheet is moving therebetween to engage said moving sheet in sandwiching position between said sets of rotating forming rolls for sufficient time to impart the shape of said rolls onto said sheets, and cooling each roll formed sheet until it is cooled to below a temperature at which it is subject to deformation on contact with a solid object while conveyed on rolls in a cooling station, said rolls having shapes similar to the shape of said forming rolls and positioned with their common center line normally in alignment with the common center line of said forming rolls,

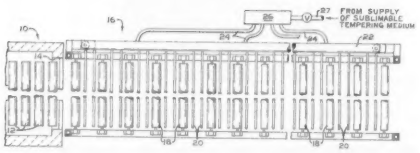
the improvement comprising offsetting the rolls in the forming station or the shaped conveyor rolls in the cooling station laterally with respect to the center line of the predetermined path of movement of the sheets in an amount sufficient to modify the curvature of portions of the sheets disposed outwardly of the center line of the longitudinally extending path of movement of the sheets.

3,929,442

TEMPERING GLASS SHEETS BY HEAT OF SUBLIMATION

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,766
Int. Cl.² C03B 27/00
U.S. Cl. 65—114 6 Claims



1. In a method of tempering a glass sheet comprising:

heating said glass sheet to an elevated temperature range sufficiently high to impart a temper thereto on sudden chilling;

applying toward opposite surfaces of said glass sheet, throughout the areal extent of said surfaces, a cooling medium containing as a primary source of cooling soft particles of a solid sublimable material having a sublimation temperature below the strain point of the glass; and cooling said glass sheet with said cooling medium from said elevated temperature to a temperature below the strain point of the glass; the improvement comprising

applying said soft particles toward the opposite glass sheet surfaces from a system of apertures having a total aperture area facing each surface of said glass sheet less than 5% of the area of each said surface, said apertures being positioned sufficiently close to the adjacent surface of the glass sheet that solid particles of a sublimable material come into close proximity to said adjacent surface and being distributed through the areal extent of each said surface and spaced sufficiently close to one another that a spray of said sublimable material covers the entire area of each said surface of said glass sheet, and

removing said cooling medium from the vicinity of said glass sheet along exhaust paths facing the glass sheet surfaces that occupy at least 50% of the areal extent of each said glass sheet surface.

3,929,443

METHOD FOR CURING FISSURES AND THE LIKE OF WORKPIECES FORMED OF METAL OXIDE MATERIALS AND PROCESSED UNDER HIGH MATERIAL STRESS

Hans-Ulrich Leuenberger, and Reiner Stemme, both of Thun, Switzerland, assignors to Lasag S.A., Thun, Switzerland

Continuation-in-part of Ser. No. 429,520, Jan. 2, 1974, abandoned. This application June 17, 1974, Ser. No. 479,884
Claims priority, application Switzerland, Jan. 11, 1973, 382/73
Int. Cl.² C03B 29/00
U.S. Cl. 65—117 6 Claims

1. In a method of treating machined workpieces of rubies, sapphires and sintered metal oxides wherein fissures are present in the workpieces as a result of the machining operation, the improvement comprising the steps of:

providing a workpiece having fissures present therein as a result of the machining operation; and

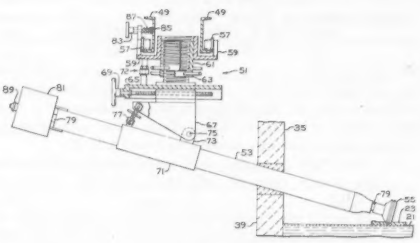
curing the fissures by heating the workpiece in a furnace to a temperature ranging from about 1200° to 1600°C for a time which is effective in reducing the magnitude of the fissures whereby the danger of rupture of the workpiece by said fissures is lessened.

3,929,444

APPARATUS FOR MAKING FLAT GLASS INCLUDING AN EDGE STRETCHING APPARATUS

Earl L. May, and Joseph J. Fisher, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1974, Ser. No. 448,786
Int. Cl.² C03B 17/00, 19/00
U.S. Cl. 65—182 R 6 Claims



1. In an apparatus for making flat glass wherein the position of a marginal portion of a body of glass supported on a pool of molten metal in a chamber in controlled to establish and maintain a desired width and thickness of the glass, the combination comprising:

a. structural support means mounted outside the chamber at an elevation above the pool of molten metal;

b. a carriage including a carriage frame, adjustable mounting means, and a mounting platform mounted on and depending downwardly from the structural support means;

c. an elongated member mounted on the mounting platform of the carriage and being extendable beneath the support means, through a side wall of the chamber and over the pool of molten metal; and

d. means for engaging glass supported on the pool of molten metal mounted on the elongated member and providing means for applying a force to the glass, wherein

the adjustable mounting means of the carriage comprises means for elevating the mounting platform and the

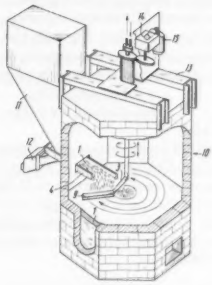
elongated member, means for rotating the mounting platform and the elongated member and means for locking the position of the mounting platform with respect to the carriage frame whereby the elevation and the plan orientation of the elongated member may be adjusted and maintained with respect to the structural support means.

3,929,445

MIXTURE FEEDER FOR CONTINUOUS ELECTRIC GLASS-MELTING FURNACE

Alfred Zippe, Am Freiergrahen 10, 698 Wertheim, Germany

Filed July 5, 1974, Ser. No. 486,272
Int. Cl.² C03B *3/00*
U.S. Cl. 65—335 **10 Claims**



1. Apparatus for delivering a fusible mixture to a blanket of said mixture floating on a molten glass mass in a vertical glass-melting furnace comprising:

i. delivery means extending through the furnace sidewall and into the furnace interior, said delivery means being positioned above said blanket;

ii. means for continuously feeding and fusible mixture to said delivery means; and

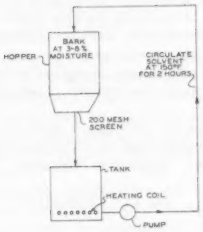
iii. horizontal arm means mounted in the furnace for spreading and leveling mixture delivered to said blanket, said arm means being vertically adjustable and adapted to rotate about a vertical axis in a circular path below the delivery means.

3,929,446

SLOW NITROGEN RELEASING FERTILIZERS AND METHODS OF MAKING THE SAME

Frank S. Trocino, Eugene, Oreg., assignor to Bohemia Inc., Eugene, Oreg.

Filed Apr. 19, 1974, Ser. No. 462,362
Int. Cl.² C05F *11/00*; **C05C** *9/00*; **C05B** *15/00*; **C05G** *1/02*
U.S. Cl. 71—23 **13 Claims**



1. A fertilizer product comprising a matrix material of Douglas fir bark having a substantial portion of its wax and cork removed, and a water-soluble nutrient fertilizer material blended into said matrix.

8. The method of making a fertilizer product comprising first extracting wax and then removing cork from Douglas fir bark to leave a matrix material, and then blending a water-soluble nutrient fertilizer material with said matrix material.

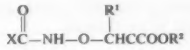
3,929,447

SELECTED AMIDOXY COMPOUNDS AS FLOWER PRESERVATIVES

Elmo M. Beyer, Jr., and Bruno Quebedeaux, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 19, 1973, Ser. No. 325,091
Int. Cl.² A01N *3/02*
U.S. Cl. 71—68 **4 Claims**

1. A method of extending the life of a cut flower which comprises putting the cut stem end of a flower in an aqueous solution containing a compound of the formula



wherein

X = NHR in which R is H, alkyl or chloroalkyl of up to 3 carbons;

R^1 = H or alkyl of up to 3 carbons;

R^2 = H, alkyl of up to 3 carbons, ammonium, alkali metal or alkaline earth metal ion;

the said compound being present to the extent of **100–1000** ppm.

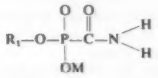
3,929,448

METHOD FOR ENHANCING THE LIFE OF CUT FLOWERS

Richard K. Brantley, 706 Cheltenham Road, Wilmington, Del. 19808

Filed July 5, 1974, Ser. No. 486,018
Int. Cl.² A01N *3/02*
U.S. Cl. 71—68 **21 Claims**

1. A method for preserving and enhancing the beauty of a cut flower comprising contacting the cut flower with an aqueous solution containing an effective amount of a compound of the formula:



wherein R_1 represents an alkyl group of 1 to 4 carbon atoms or an alkenyl group of 3 to 4 carbon atoms, and M represents an ammonium or alkali metal ion;

for a sufficent time to substantially preserve and prolong retention of the natural appearance and enhance the beauty of the flower.

3,929,449

METHOD OF ALLEVIATING DERMAL TOXICITY OF PESTICIDE COMPOSITIONS

Loren W. Hedrich, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,383
Int. Cl.² A01N *13/00*
U.S. Cl. 71—82 **2 Claims**

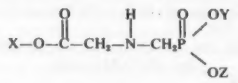
1. The method of alleviating the dermal toxicity of a composition containing 1-methyl-4-phenylpyridinium chloride which comprises incorporating into said composition an effective amount of an astringent substance selected from the group consisting of aluminum sulfate, aluminum potassium sulfate and tannic acid.

3,929,450
HERBICIDAL COMPOSITIONS AND METHODS

Philip C. Hamm, Glendale, and David E. Schafer, St. Louis County, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed June 28, 1974, Ser. No. 484,053
Int. Cl.² A01N 9/36
U.S. Cl. 71—86 **15 Claims**

1. A herbicidal composition consisting essentially of an inert diluent and an effective amount of: a glycine compound of the formula



wherein X is lower alkyl, H, lower alkoxyalkyl, lower alkoxyalkoxyalkyl or a salt-forming cation selected from the group consisting of alkali metals, alkaline earth metals, ammonia and amines having a molecular weight below about 300, Y and Z are H or a salt-forming cation as described for X; and a phosphonate compound of the formula

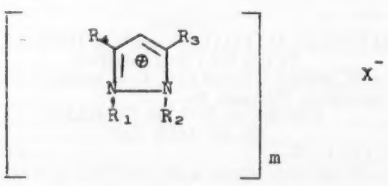
wherein R is an aliphatic hydrocarbon radical of from 1 to 20 carbon atoms or such a radical substituted with halogen, hydroxy or an alkylphenyl group and M and M_1 are each hydroxy, chlorine, the same or different lower alkoxy or an alkali metal oxy group.

3,929,451
PRE-EMERGENCE 1,2-DIALKYL-3,5-DISUBSTITUTED HERBICIDAL COMPOUNDS AND METHOD FOR USING SAME

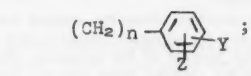
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 21, 1973, Ser. No. 399,655
Int. Cl.² A01N 9/22
U.S. Cl. 71—92 **4 Claims**

1. A method for the pre-emergence control of undesirable broadleaf weeds and grasses comprising applying to soil containing seeds of said undesirable broadleaf weeds and grasses, a herbicidally effective amount of a compound having the structure:



where R_1 and R_2 are each alkyl, (C_1 – C_4), R_3 is cycloalkyl (C_3 – C_7), methyl-substituted cycloalkyl (C_3 – C_7), alkyl (C_5 – C_{11}), or



R_4 is cycloalkyl (C_3 – C_7), methyl substituted cycloalkyl (C_3 – C_7), or peutyl; n is 0 or 1; Y and Z each represents hydrogen, halogen, nitro, methylthio, methylsulfonyl, cyano, carboxyl, carboalkoxy (C_1 – C_4), alkyl C_1 – C_4, haloalkyl C_1 – C_4 containing 1 to 4 halogen groups, or alkoxy (C_1 – C_4); X is an anion having a charge of from 1 to 3; and m is 1, 2 or 3.

3,929,452
HERBICIDAL COMPOSITION

Ichiro Kimura, Shuzuoka; Hironari Sugiyama; Kiyoshi Takita, both of Shimizu, and Makoto Mizutani, Oyama, all of Japan, assignors to Kumiai Chemical Industry, Japan

Continuation-in-part of Ser. No. 128,134, March 25, 1971, abandoned, and a continuation-in-part of Ser. No. 117,711, Feb. 22, 1971, abandoned. This application July 26, 1974, Ser. No. 492,273
Int. Cl.² A01N 9/12
U.S. Cl. 71—100 **10 Claims**

1. A herbicidal composition consisting essentially of an effective amount of the mixture of 1 part by weight S-(monochloro, dichloro or methylbenzyl) N,N-diloweralkyl-thiocarbamate and 0.1 – 1.0 parts by weight of 2,4-dichlorophenoxy acetic acid or 2-methyl-4-chlorophenoxyacetic acid or the lower aliphatic hydrocarbyl esters or alkali metal salts thereof as active ingredients.

3,929,453
COMPOSITES OF LIGNIN AND BIOLOGICALLY ACTIVE MATERIALS

Mitchell S. Dimitri, Charleston, and Sten I. Falkehag, Mount Pleasant, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,375
Int. Cl.² A01N 9/12
U.S. Cl. 71—101 **2 Claims**

1. A process for making a controlled release herbicide containing composite which consists essentially of;

a. emulsifying an aqueous slurry containing at least an effective amount of 2-chloroallyl diethyldithiocarbamate and an alkali lignin at a weight ratio of greater than 1:1 to 1:4 2-chloroallyl diethyldithiocarbamate to alkali lignin,

b. acidifying said emulsion with a mineral acid to a pH between about 2 and 6, to thereby precipitate said 2-chloroallyl diethyldithiocarbamate/alkali lignin, physically absorbing the 2-chloroallyl diethyldithiocarbamate throughout the alkali lignin matrix to form a micro dispersion, and

c. drying said precipitated materials.

3,929,454
SUBSTITUTED O-[AMINOSULFONYL]-GLYCOLIC ANILIDES HERBICIDES

Adolf Fischer, Mutterstadt; Gerhard Hamprecht, Mannheim; Dietrich Mangold, Neckargemuena, and Wolfgang Rohr, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 321,548, Jan. 5, 1973, Pat. No. 3,870,740. This application Sept. 3, 1974, Ser. No. 502,740
Claims priority, application Germany, Jan. 13, 1972, 2201432
Int. Cl.² A01N 9/14
U.S. Cl. 71—103 **2 Claims**

1. A process for controlling the growth of unwanted plants wherein the soil in which unwanted growth is to be prevented is treated with a herbicidally effective amount of a substituted O-(aminosulfonyl)-glycolic anilide of the formula

where R^1 denotes hydrogen, alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, cyclopentyl, or cyclohexyl, R^2 denotes phenyl, and R^3 denotes a member selected from the group consisting of methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tertbutyl, pentyl, cyclopentyl, hexyl, cyclohexyl, allyl, butenyl, pentenyl, hexenyl, propargyl, butynyl, pentynyl, or benzyl.

3,929,455

HERBICIDAL HALOPHENOXY BENZOIC ACID SALTS

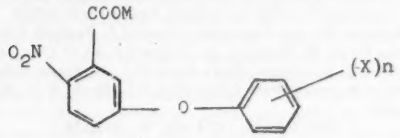
Robert J. Theissen, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 194,479, Nov. 1, 1971, Pat. No. 3,776,715, which is a division of Ser. No. 819,412, April 25, 1969, Pat. No. 3,652,645. This application Sept. 12, 1973, Ser. No. 396,630

Int. Cl.² A01N 9/24

U.S. Cl. 71—115 20 Claims

1. The method for controlling plant growth that comprises applying an herbicidal amount of an herbicidal compound having the formula:



wherein *X* is halogen, *n* is 1 to 5, and *M* is alkali metal (Li, Na, K), alkaline earth metal, a transition metal, ammonium, alkylammonium (C_1–C_{30}), alkanolammonium (C_1–C_3), alkyl (C_1–C_{30}) dialkanol (C_2–C_3) ammonium, dioxyalkylene (C_2–C_3) alkyl (C_1–C_{30}) ammonium, dialkylammonium (C_1–C_{30}), trialkylammonium (C_1–C_{30}), alkoxyalkylammonium (C_2–C_6) dialkoxyalkylammonium (C_2–C_6), aminoalkylammonium (C_1–C_{30}), dialkylaminoalkylammonium (C_2–C_6), alkenylammonium (C_2–C_{22}), alkyl (C_1–C_{30}aminoalkyl (C_2–C_6) ammonium, alkenyl (C_2–C_{30}) aminoalkyl (C_2–C_6) ammonium, alkynyl (C_3–C_{12}) ammonium dialkenylammonium (C_4–C_{18}), cycloalkylammonium (C_3–C_6), alkyl (C_1–C_{30}) ammonium alkyl (C_2–C_6) ammonium, benzylammonium, anilinium, substituted anilinium, guanidinium or heterocyclicammonium (C_4–C_6).

3,929,456

CARBOTHERMIC PRODUCTION OF ALUMINUM

Robert M. Kibby, Florence, Ala., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 250,748, May 5, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,271

Int. Cl.² C22B 21/02

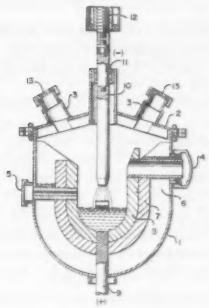
U.S. Cl. 75—10 R 12 Claims

1. A carbothermic process for the production of aluminum from an aluminum oxide which comprises:

a. striking an open electrical arc to a portion of the surface of a charge comprising an aluminum oxide and at least one material selected from the group consisting of carbon, aluminum compounds containing carbon, and mixtures thereof;

b. limiting the heating effect of the arc by controlling the time the arc is struck to any given portion of the surface of said charge so that the aluminum formed by the reaction of the charge is maintained substantially in the liquid state with the proviso that only a small portion of the charge in the reaction zone is heated to reaction temperature while the majority of the charge in the reaction zone is not at reaction temperature at any given time; and

c. causing the liquid aluminum formed under the arc to flow away from the arc and over the non-reacted portion of



the charge and be collected, said liquid aluminum containing no more than about five weight percent of aluminum carbide.

3,929,457

DIRECT CURRENT ELECTRIC ARC FURNACE AND METHOD FOR MELTING METAL SCRAP

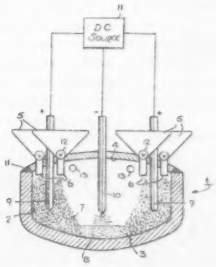
Sven Einar Stenkvist, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Nov. 16, 1973, Ser. No. 416,400

Claims priority, application Sweden, Nov. 17, 1972, 14953/72

Int. Cl.² C22B 4/00; H05B 7/18

U.S. Cl. 75—10 R 6 Claims



1. A direct current electric arc furnace for melting metal scrap, comprising means for containing a molten scrap melt and a charge of unmelted scrap in electrical contact with this melt, said scrap extending from this melt to a location free from said melt, at least one carbon electrode positioned to form an open arc between this electrode and said melt, a direct current power source and means for electrically conducting direct current from said source to said unmelted scrap at said location and through said unmelted scrap and melt and an arc, to said electrode so that the said electrode operates as a cathode.

3,929,458
PROCESS FOR THE ELABORATION OF CHROME STEELS

Pierre Leroy, Saint-Germain-en-Laye; Maurice Debras, Saint-Etienne; Michel Cadart, and Jean Saleil, both of Saint-Etienne, all of France, assignors to Creusot-Loire, Paris, France

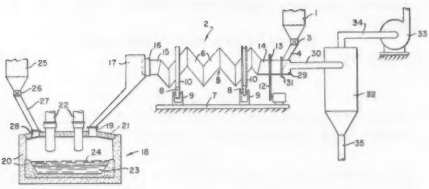
Filed Jan. 10, 1974, Ser. No. 432,309
Claims priority, application France, Feb. 7, 1973, 73.04266
Int. Cl.² C21C 5/52; H05B 7/18
U.S. Cl. 75—12 12 Claims

1. In a method of making a chrome steel which includes the step of blowing oxidizing gas into a molten steel-making charge containing chromium, the steps of introducing the charge in an electric arc furnace, to decarburise the charge, the charge initially having a carbon content of above 0.7 percent, blowing at least one submerged jet of oxidizing gas into the charge below the surface thereof and passing through the bath from the bottom of said furnace upwards, each said jet being surrounded at its periphery, at its point of entry into the charge, by a fluid protectant for the refractory lining of said furnace.

3,929,459
CHARGING AN ELECTRIC FURNACE

Jack E. Tress, and Willard L. Hunter, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 13, 1974, Ser. No. 450,636
Int. Cl.² C21C 5/52
U.S. Cl. 75—12 8 Claims



1. A process for charging solid objects comprising metals of varying size and shape into an electric furnace which comprises:

introducing said metallic objects into one end of an unobstructed tubular container of undulant shape, said container being disposed with its longitudinal axis in a substantially horizontal attitude and being adapted to rotate about its longitudinal axis;

rotating said container to cause said objects to be advanced through the container to the opposite end thereof and to cause a tumbling and mixing action in which said objects are repeatedly passed through a hot counter-flowing gas stream while advancing through said container to rapidly transfer the heat content of said gas stream to said objects, and

discharging said objects from the container into conduit means communicating with the interior of an electric furnace in counterflow relationship to hot gases emanating from said furnace and passing through said conduit means and through said container thereby cooling said hot furnace gases and heating said objects.

3,929,460
PROCESS FOR THE PREPARATION OF VANADIUM, VANADIUM ALLOYS OR VANADIUM COMPOUNDS

Franciscus J. W. M. Peters; Servaas Middelhoek, and Albert Rijkeboer, all of Arnhem, Netherlands, assignors to Billiton Research B. V., Netherlands

Filed June 11, 1974, Ser. No. 478,415
Claims priority, application Netherlands, June 25, 1973, 7308789
Int. Cl.² C22B 7/04, 34/22
U.S. Cl. 75—24 5 Claims

1. A process for the extraction of vanadium containing slags which comprises heating vanadium containing slags in a reaction furnace with sodium carbonate and oxygen at a temperature between 600°C and 800°C to provide a reaction product containing soluble vanadate and subsequently leaching the reaction product with water to provide a vanadate solution the amount of sodium carbonate utilized being such that the ratio

$$\frac{\text{quantity by weight of sodium carbonate}}{\text{quantity by weight vanadium calculated as vanadium pentoxide}}$$

is at least 1.1 and does not exceed 4.

3,929,461
FUSION-OXIDATION PROCESS FOR RECOVERING VANADIUM AND TITANIUM FROM IRON ORES

T. Kenneth Miyoshi, Lakewood; Cornelius E. Berthold, Littleton; Frank M. Stephens, Jr., Lakewood, all of Colo., and Alfred K. Schellinger, South Perth W.A., Australia, assignors to Ferrovanadium Corporation N.I., Perth, W.A., Australia

Filed Feb. 27, 1974, Ser. No. 446,156
Int. Cl.² C21B 3/04
U.S. Cl. 75—30 8 Claims

1. A process for the recovery of vanadium from vanadium-bearing ores comprising:

reducing the ore to recover substantially all of the iron and to produce a slag containing the vanadium,

treating the slag with an alkali metal salt in sufficient quantity to produce a completely fused product upon sufficient heating of the slag and so heating the slag and alkali metal salt thereby forming an altered slag,

oxidizing the molten altered slag in order to oxidize the vanadium to its plus five valance state,

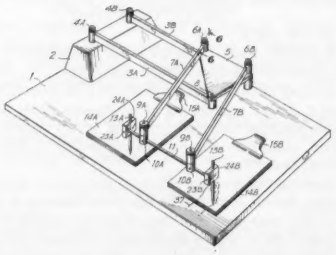
leaching the slag to extract the oxidized vanadium, and

recovering the vanadium from the leach solution.

3,929,462
PATTERN TRAINING APPARATUS

Irving Karmin, 3915 Orloff Ave., Bronx, N.Y. 10463

Filed Oct. 21, 1974, Ser. No. 516,786
Int. Cl.² G09B 11/00; B43L 13/10
U.S. Cl. 35—37 4 Claims



1. An educational apparatus for patterning manual movements, comprising:

a pair of styli adjustably fixed to a transverse support rod which has fixed to itself a set of dowel pins pivotally connected to the first end of;
a pair of secondary arms, the second end of each arm is pivotally connected to the first pair of dowel pins on;
a coupling plate and a second pair of dowel pins on the coupling plate is pivotally attached to;
a pair of primary arms having holes at each end of each arm, the holes furthest from the coupling plate being pivotally attached to a support having a pair of dowel pins and attached to;
a base having a plane surface, to which is attached;
a recording material for making the pattern formed visible.

3,929,463

METHOD OF CARRYING OUT ENDOTHERMIC METALLURGICAL REDUCTION PROCESSES WITH THE AID OF A CONTINUOUSLY OPERATING MECHANICAL KILN

Karl Jonas Valter Svensson, Strossa, Sweden, assignor to Granges Aktiebolag, Stockholm, Sweden

Filed Jan. 4, 1974, Ser. No. 430,620
Claims priority, application Sweden, Jan. 9, 1973, 73002404; Jan. 9, 1973, 73002412
Int. Cl.² C21B *13/00*; C22B *15/00, 23/00*
U.S. Cl. 75—37 **6 Claims**

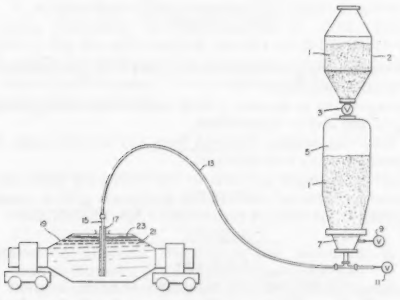
1. In a continuous method of effecting an endothermic metallurgical reduction reaction in the reactor space of a rotatable mechanical kiln as reaction vessel, in which the reaction materials at ambient temperature or in a preheated state are continuously charged into the reaction space and the resulting reaction mixture continuously discharged from the kiln, the improvement which comprises causing the charged kiln to rotate at lower than the speed at which the charge closest to the kiln wall ceases to move relative to the wall, whereby the charge is continuously isolated from air whilst being cascaded on itself and thereby autogeneously disintegrated and heated without any other heating to a temperature at which reaction is effected.

3,929,464

DESULFURIZATION OF MOLTEN FERROUS METALS

Lamar S. Todd, Tonawanda; Alan Fitzgibbon, Lewiston; Michael C. Carosella, Niagara Falls, and Donald C. Hilty, Sanborn, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,505
Int. Cl.² C21C *7/00, 7/02*
U.S. Cl. 75—58 **5 Claims**



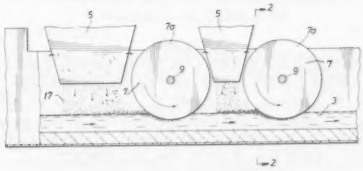
1. A method for lowering the sulfur content of molten iron from the range of about 0.025% to 0.075% to not more than 0.015% by the injection of calcium carbide into said molten iron said method not requiring agitation by gas injection subsequent to the injection of calcium carbide and requiring not more than about 4 pounds of calcium carbide per ton of iron per 0.01% of sulfur removed in said range, said method comprising the steps of:
i. providing in a vessel molten iron containing sulfur impurity in an amount of at least 0.025%.
ii. providing finely divided particles of calcium carbide in a gas stream substantially all of said finely divided particles of calcium carbide being not larger than 200 microns, at least about 50 percent of said particles being not larger than 50 microns and at least 20 percent being not larger than 10 microns and the aggregate of said particles of calcium carbide having a Fischer sub-sieve number of less than about 12.
iii. injecting said calcium carbide containing gas stream at a velocity of not more than about 15 feet per second into the lower 75% of the total depth of molten iron to thereby reduce the sulfur content of said molten iron and provide in said molten iron a sulfur content of not more than 0.015% upon termination of calcium carbide injection.

3,929,465

METHOD EMPLOYING BARRIER MEANS TO SUBMERGE PARTICLES IN A MOLTEN METAL STREAM

Sam Proler, 5106 Contour Place, Houston, Tex. 77035

Continuation-in-part of Ser. Nos. 306,429, Nov. 4, 1972, Pat. No. 3,881,915, and Ser. No. 161,905, July 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 29,325, March 30, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,878
Int. Cl.² C22B *1/00*
U.S. Cl. 75—65 R **19 Claims**



1. In a method for enhancing the processing of metal, including ores, compounds and concentrates thereof, on a substantially continuous basis in a molten metal stream by optimising heat transfer of the stream to the metal to be charged thereto comprising the steps of:
providing a coherent stream of molten metal that constitutes the medium in which processing takes place, said stream being characterized by a discreet width and length, the length including a longitudinal axis in the direction of stream flow,
introducing to the stream on a substantially continuous basis a material charge, said material charge occuring at an area of introduction above the linearly moving stream, constantly moving said stream past the area of introduction there beneath and thus moving the charged material also away from the area of introduction and thus presenting an entirely new mass of stream beneath the area of introduction so as to thus maintain a constant temperature of molten metal in the stream at the area of introduction, thereby maximizing the rate of heat transferred to the charged material,
disposing a physical barrier means downstream of the point of introduction to the stream of the material charge and such that said barrier means is in contacting relation to the charged material floating in the stream and which is exposed above the surface thereof, said physical barrier means applying physical force to the charged material on the stream surface so as to physically submerge the charged material below the streams surface, said physical barrier means being substantially coterminous with the stream width to thereby insure complete physical submersion of all of the material charge.

3,929,466
RECOVERY OF SILVER FROM SILVER SALTS

Edward B. Moynahan; August H. Brunner, Jr., both of Binghamton, and Gerald R. Skreckoski, Apalachin, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed June 28, 1974, Ser. No. 484,349
Int. Cl.² C22B *11/00*
U.S. Cl. 75—83 30 Claims

1. A method of converting a silver salt to metallic silver, which comprises heating, to a temperature of at least about 300°C but below the melting point of silver, an admixture comprising a silver salt and an oxygen-containing alkali metal compound that will react with said silver salt at said temperature to form silver metal, for a period of time at least sufficient to convert said silver salt to metallic silver, said temperature being sufficient to initiate said conversion.

3,929,467
GRAIN REFINING OF METALS AND ALLOYS

Peter Wesley Davies, and John Philip Dennison, both of Swansea, England, assignors to The International Nickel Company, Inc., New York, N.Y.

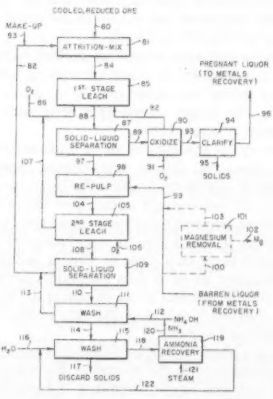
Filed May 21, 1973, Ser. No. 362,521
Int. Cl.² C22B *9/12*; C22C *1/06*, *19/05*
U.S. Cl. 75—93 G 11 Claims

1. A process for grain refining a metal or alloy during solidification from the molten state which comprises introducing into a melt of the metal or alloy an innoculating additive comprised of a nickel carrier and tungsten oxide particles in at least a small but effective amount sufficient to induce grain refinement upon solidification, nickel dissolving in the melt and solid tungsten oxide nuclei being dispersed therein.

3,929,468
PROCESS FOR RECOVERY OF NON-FERROUS METALS FROM OXIDE ORES AND CONCENTRATES

Richard E. Siemens, and Philip C. Good, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,227
Int. Cl.² C22B *23/04*, *15/10*
U.S. Cl. 75—103 39 Claims



1. A process for the recovery of nickel from laterite ores which comprises:

comminuting said laterite ore to a finely divided state;

pelletizing said comminuted ore;

drying the pelletized ore at a temperature sufficiently high to drive off all free moisture and limonitic water but at a temperature sufficiently low so as not to drive off chemically combined silicate water;

contacting the dried ore with a reductant gas consisting essentially of carbon monoxide at a temperature in the range of 350° to 600°C for a time sufficient to reduce substantially all nickel oxide contained in the ore to elemental metal;

cooling the reduced ore to a temperature below about 200°C in an oxygen and water-free environment;

mixing said cooled ore with a leach solution comprising an aqueous ammonia-ammonium sulfate solution, said mixing being coupled with attrition sufficiently intense to disintegrate the ore pellets and to form a suspension of reduced ore in the leach solution;

contacting said suspension with gaseous oxygen for a time sufficient to oxidize substantially all of the elemental nickel contained in the reduced ore and to stabilize the oxidized nickel in the leach solution as its divalent ammine complex;

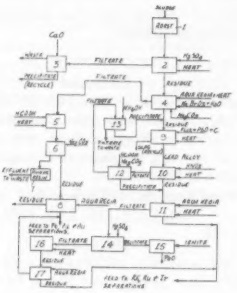
separating the nickel containing leach solution from the ore residue; and

recovering nickel values from said leach solution.

3,929,469
SEPARATION AND PURIFICATION OF GOLD

Willem Hubert Pittie, Roodepoort; Gerhardus Overbeek, Florida, and Kingsley Ferguson Doig, Johannesburg, all of South Africa, assignors to Swarsab Mining, Exploration & Development Company (Proprietary) Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 384,825, Aug. 2, 1973, abandoned. This application July 23, 1974, Ser. No. 490,970
Claims priority, application South Africa, Aug. 10, 1972, 72/5488
Int. Cl.² C01G *7/00*
U.S. Cl. 75—108 6 Claims



1. In separating gold from one or more PGMs, the improvement which comprises:

a. evaporating to dryness a nitric acid solution comprising gold and one or more PGMs,

b. dissolving residue obtained from (a) in nitric acid to produce nitric acid solution,

c. adding hydrogen peroxide to and boiling the nitric acid solution obtained from (b) to precipitate gold in metal form.

3,929,470
GLASS-METAL SEALING ALLOY

Thomas H. Gray, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Sept. 21, 1973, Ser. No. 399,589
Int. Cl.² C22C *38/50*
U.S. Cl. 75—122 4 Claims

1. An alloy consisting essentially of from 38% to 45% nickel, from 3% to 15% chromium, from 0.1% to 1.0% tita-

nium, up to 0.1% carbon and the balance iron and residuals; said alloy having a grain size finer than ASTM No. 6.

3,929,471

HIGH SPEED STEEL HAVING HIGH WEAR-RESISTANCE

Kimihiko Akahori, Katsuta, and Masayuki Era, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1972, Ser. No. 316,897

Claims priority, application Japan, Dec. 22, 1971, 46-103687

Int. Cl.² C22C *38/12, 38/24, 38/36*

U.S. Cl. 75—123 J 19 Claims

1. A high speed steel having wearresistance consisting essentially of 1.79 to 4.78% by weight carbon, 5 to 12% by weight vanadium, 3 to 10% by weight niobium, and the balance essentially iron, wherein substantially all of vanadium and niobium are present in carbide form, wherein 0.2 to 0.6% by weight of carbon is contained in a ferrous matrix, wherein the weight ratio of niobium to vanadium (Nb/V) is from 0.6 to 1, and wherein the area ratio of the carbide particles is 12 to 30%.

2. A high speed steel which consists essentially of 1.79 to 4.78% by weight carbon, 5 to 12% by weight vanadium, 3 to 10% by weight niobium, and at least one of 2 to 6% by weight chromium, 1 to 6% by weight molybdenum and 1 to 6% by weight tungsten, the balance being essentially iron, wherein substantially all of the vanadium and niobium are in carbide form, wherein 0.2 to 0 6% by weight of carbon is contained in a ferrous matrix, wherein the weight ratio of niobium to vanadium (Nb/V) is from 0.6 to 1, and wherein the area ratio of the carbide particles is 12 to 30%.

3,929,472

STEEL SHEETS HAVING EXCELLENT RUST RESISTANCE

Hideya Okada, Yokohama, and Haruo Shimada, Tokyo, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 358,305, May 8, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,579

Claims priority, application Japan, May 11, 1972, 47-46648; July 8, 1972, 47-67889; Mar. 31, 1973, 48-27120

Int. Cl.² C22C *38/00*

U.S. Cl. 75—124 3 Claims

1. A steel sheet having excellent rust and corrosion resistance, consisting of 0.001–0.15% C, 0.01–1.04% Si, 0.01–1.0% Mn, 0.001–0.05% Al, 0.01–0.5% Cu, 0.001–0.04% P, 0.002–0.07% S and Ce in an amount to maintain the weight ratio of Ce/S between 0.1–50, with the balance being iron and unavoidable impurities.

3,929,473

CHROMIUM, MOLYBDENUM FERRITIC STAINLESS STEELS

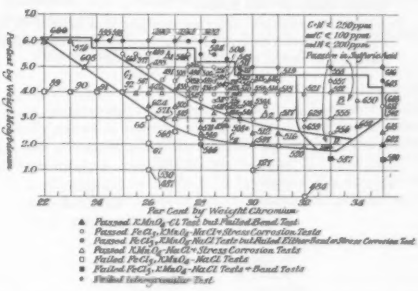
Michael A. Streicher, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 122,529, March 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 46,428, June 15, 1970, abandoned. This application May 30, 1974, Ser. No. 474,543

Int. Cl.² C22C *38/44*

U.S. Cl. 75—128 W 2 Claims

1. A corrosion-resistant ferritic iron-chromium-molybdenum alloy having good post-welding ductility consisting essentially of chromium and molybdenum in the weight percentages within areas A_2 and C_2 of FIG. 1, 0.25 –3.0 weight per cent Ni, carbon 100 ppm maximum, nitrogen 200 ppm maximum, and carbon plus nitrogen 250 ppm maximum, the balance being iron and incidental impurities.


Per Cent by Weight Molybdenum
Per Cent by Weight Chromium
C+N ≤ 250 ppm
maC ≤ 100 ppm
mN ≤ 200 ppm
Passive in Sulfuric Acid
▲ Passed: KMnO4-CuTest and Pitted Bend Test
○ Passed: FeCl3-KMnO4-HnCl+Stress Corrosion Tests
● Passed: FeCl3-KMnO4-HnCl Tests but Pitted Either Bend or Stress Corrosion Test
△ Passed: KMnO4-HnCl+Stress Corrosion Tests
□ Failed: FeCl3-KMnO4-HnCl Tests
■ Failed: FeCl3-KMnO4-HnCl Tests + Bend Tests
• Pitted Intergranular Test

3,929,474

TARNISH RESISTANT SILVER BASED DENTAL CASTING ALLOY CAPABLE OF BONDING TO PORCELAIN

Clyde E. Ingersoll, Tonawanda, N.Y., assignor to Williams Gold Refining Company Incorporated, Buffalo, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,566

Int. Cl.² C22C *5/04, 5/06*

U.S. Cl. 75—172 G 7 Claims

1. An alloy consisting essentially of about 28–64% AG, about 37.5–57.7 % Pd, about 0.5–7% of at least one member of the class consisting of Cr, Fe, In and Sn and from 0 to about 5% of a member of the class consisting of Si, Ni, Co, Ta, Ti, all totalling 100%; said alloy having a Vickers hardness of 150–220; said alloy when containing Sn further containing a member selected from the group consisting of about 0.5% in, 1.0% Ti, 5.0% Ni, 17% Si, and 5% Fe; and said alloy when containing Fe further containing a member selected from the group consisting of about 0.5% Ta, about 2.0% Ni, and about 0.5% In and about 0.5% Sn.

3,929,475

TARNISH RESISTANT SILVER BASED DENTAL CASTING ALLOY HAVING SUPERIOR IMPROVED DUCTILITY AND WORK HARDENING CHARACTERISTICS

Clyde E. Ingersoll, Tonawanda, N.Y., assignor to Williams Gold Refining Company Incorporated, Buffalo, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,565

Int. Cl.² C22C *5/06*

U.S. Cl. 75—173 R 6 Claims

1. An alloy consisting essentially of about 15–30% Pd, about 0.2–10% of an element of the group consisting of Cr, Fe, and In and mixtures thereof and the balance Ag.

3,929,476

PRECISION MOLDED REFRACTORY ARTICLES AND METHOD OF MAKING

Russell B. Kirby, Jr., Baytown Township, Washington County, and Stephen C. Wing, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 250,620, May 5, 1972, Pat. No. 3,823,002. This application Nov. 14, 1973, Ser. No. 415,510

Int. Cl.² B22F *3/00*

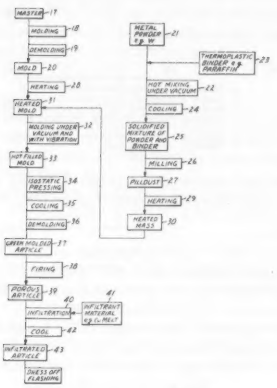
U.S. Cl. 75—214 4 Claims

1. A process for forming a refractory article comprising the steps of:

warm mixing multi-modal refractory powder under reduced pressure with up to 45 volume percent of thermoplastic binder;

heating the powder-binder mixture above the softening temperature of said binder;

molding the resulting softened mixture in a heated flexible mold to form an essentially void-free green molded article having the shape and size of said mold;



packing the green molded article in a nonreactive refractory powder;

heating said green molded article in contact with an infiltrant to volatilize the thermoplasitc binder, consolidate the refractory powder and infiltrate with a molten infiltrant metal, forming an infiltrated refractory article with a linear shrinkage of less than 2 percent;

and cooling the infiltrated part to solidify said infiltrant and form a refractory article.

3,929,477
IMAGE PRODUCING TECHNIQUES OF SUPERCONDUCTING MATERIAL IN A MAGNETIC FIELD

Eugene F. Young, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 15, 1973, Ser. No. 332,664
Int. Cl.² G03G *16/00*
U.S. Cl. 96—1 R **16 Claims**

1. A method of producing viewable images, comprising the steps of:

providing a surface comprised of material admitting of superconductive characteristics;

decreasing the ambient temperature below a critical temperature value such that said surface exhibits a superconducting state;

applying a magnetic field below a critical field value to said superconducting surface;

selectively increasing the temperature of certain portions of said superconducting surface in accordance with a determined pattern such that the superconductivity of said certain portions is quenched and said applied magnetic field penetrates said certain portions;

returning said certain portions to their superconducting states such that said penetrated magnetic field is trapped in said certain portions to form a magnetostatic latent image of said determined pattern;

removing said applied magnetic field; and

developing said magnetostatic latent image.

3,929,478
ELECTROPHOTOGRAPHIC ELEMENT WHICH INCLUDES A PHOTOCONDUCTIVE POLYVINYL CARBAZOLE LAYER CONTAINING AN ALICYCLIC ANHYDRIDE

Denis J. Curtin, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Aug. 28, 1974, Ser. No. 501,132
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1.5 **12 Claims**

1. In an electrophotographic element for use in an electrophotographic copy process formed of a substrate having an organic photoconductive coating formed of 2,4,7-trinitro-9-fluorenone and a polymerized vinyl carbazole present in the ratio of 0.49 to 1.23 moles of the trinitro fluorenone per monomeric unit of polymerized vinyl carbazole on one surface, the improvement wherein an alicyclic anhydride is incorporated into the organic photoconductive composition whereby the charge retention and sensitivity of the photoconductive coating is markedly improved to increase copy speed.

3,929,479
METHOD FOR IMPROVING THE PHOTOCONDUCTIVE PROPERTIES OF DYE SENSITIZED ZINC OXIDE

Fritz Rosenthal, Phoenixville, Pa., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 12, 1974, Ser. No. 441,806
Int. Cl.² B31B *1/00*; A01C *1/00*; C01G *9/02*
U.S. Cl. 96—1.7 **15 Claims**

1. In a method for improving the photoconductive response of zinc oxide particles adaptable for dye sensitization and for admixture with a liquid binder for the preparation of photosensitized electrophotographic means, which process comprises the steps of:

grinding a slurry of zinc oxide particles in a nonpolar liquid, in the absence of a binder resin and prior to admixture with a sensitizing dye, said slurry having a mole ratio of nonpolar liquid to zinc oxide in excess of 2.0,

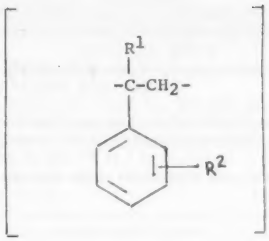
admixing a solution of sensitizing dye in a polar solvent with said slurry of ground zinc oxide particles in nonpolar liquid to contact the surface area of the unmodified zinc oxide particles with the sensitizing dye for adsorption of the dye onto the surface area of the zinc oxide particles for sensitizing same.

3,929,480
CONTINUOUS TONE ZNO - ACRYLIC POLYMER BINDER AND ADDITIVE

Barry R. Perlis, Lexington, and Michael E. Nelson, Worcester, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 63,933, Aug. 14, 1970, abandoned.
This application Aug. 5, 1974, Ser. No. 494,492
Int. Cl.² G03G *5/08*
U.S. Cl. 96—1.8 **8 Claims**

1. An electrophotographic reproduction sheet having an electrophotographic coating consisting essentially of continuous tone zinc oxide pigment providing about 15 or more steps on a 21-step photographic gray scale of 0.15 (O.D.) increments, an insulating acrylic polymer binder therefor and a polymer resin additive having the repeating unit



where

R^1 is lower alkyl or hydrogen,

R^2 is lower alkyl or hydrogen, and

wherein said lower alkyl has 1 to 4 carbon atoms, positioned on a base paper, said pigment and binder having a ratio by weight in the range from about 9:1 to about 3:1, and said additive being present in an amount which is in the range from about 5 to 40 percent of said polymer binder.

3,929,481

ETCH BLEACHING PROCESSES FOR MAKING LITHOGRAPHIC PRINTING PLATES USING SILVER HALIDE AND/OR DIFFUSION TRANSFER LAYERS AND A HYDROPHILIC LAYER

Kikuo Kubotera; Eiichi Mizuki, both of Saitama; Tadahiro Fujiwara, and Nobuo Tsuji, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 23, 1973, Ser. No. 335,219

Claims priority, application Japan, Feb. 25, 1972, 47-19922

Int. Cl.² G03C *5/54*

U.S. Cl. 96—29 L **14 Claims**

1. A method of making a lithographic printing plate from a plate comprising a support having an oleophilic surface bearing thereon a hydrophilic intermediate layer containing at least one compound selected from the following groups A, B and C:

Group A: gum arabic, alginic acid, hydroxyethyl cellulose, methyl cellulose, carboxymethyl cellulose, polyacrylamide, polyvinyl pyrrolidone, copolymers of the above components, polyvinyl alcohol, and a polyvinyl alcohol derivative;

Group B: a maleic anhydride-vinyl acetate copolymer, a maleic anhydride-ethylene copolymer, a maleic anhydride-methyl vinylether copolymer, a maleic anhydride-styrene copolymer, half ester derivatives of those copolymers, half amide derivatives of those copolymers, an acrylic acid copolymer, and a methacrylic acid copolymer; and

Group C: partially saponified cellulose acetate, partially saponified cellulose butyrate, and partially saponified cellulose acetate butyrate;

said intermediate layer bearing thereon a photosensitive silver halide emulsion layer *a*; or

a hydrophilic diffusion transfer image receiving layer (b) containing physical development nuclei, or

a layer *b* carrying thereon a silver halide emulsion layer *a'* on the side thereof away from the hydrophilic intermediate layer, which method comprises:

forming a silver image in layer *a* or *b*,

removing layer *a'* when it is present on layer *b*, and

etch bleaching the silver image, thereby etching away layer *a* or *b* at silver image portions thereof and at the same time the hydrophilic intermediate layer under the silver image portions thereof to thereby expose the oleophilic surface of the support at portions corresponding to the silver image portions in layer *a* or *b*.

3,929,482

HARDENABLE VEHICLES FOR SILVER HALIDE EMULSIONS

Ignazio Salvatore Ponticello, and Ernest John Perry, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

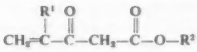
Continuation of Ser. No. 394,002, Sept. 4, 1973, abandoned. This application May 13, 1975, Ser. No. 577,141

Int. Cl.² G03C *1/72*

U.S. Cl. 96—114 **18 Claims**

1. A photographic element comprising a support having coated thereon at least one photographic silver halide emulsion and at least one binding agent comprising a film-forming, addition interpolymer comprising

A. from about 1 to about 50% by weight of a polymerized monomer containing active methylene groups and having the formula



wherein R^1 is hydrogen, methyl or

and R^2 and R^3 are alkyl radicals containing from 1 to 10 carbon atoms; and

B. from about 50 to about 99% by weight of at least one additional polymerized ethylenically un-saturated monomer free of active methylene groups.

3,929,483

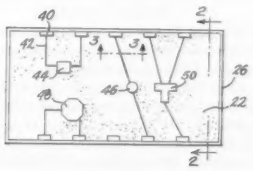
METAL-PLATED IMAGES FORMED BY BLEACHING SILVER IMAGES WITH ALKALI METAL HYPOCHLORITE PRIOR TO METAL PLATING

Eugene Wainer, Shaker Heights, and Harold J. Quaintance, Fairview Park, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Division of Ser. No. 191,635, Oct. 22, 1971, Pat. No. 3,822,128. This application Jan. 18, 1974, Ser. No. 434,537. The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.

Int. Cl.² G03C *5/00, 11/00, 5/24, 5/32*

U.S. Cl. 96—38.4 **7 Claims**



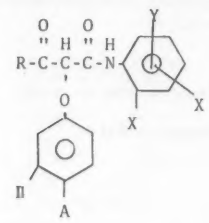
1. A product comprising a treated silver image on a base the surface of which comprises not less that 67.5 percent by volume of metallic silver and not more than 32.5 percent by volume of a carrying agent selected from the group consisting of gelatin, polyvinyl alcohol, polyacrylamide, and other water swellable hydrocolloids said product exhibiting increased photographic density and contrast as compared with the same image prior to such treatment, the said product being formed by bleaching said silver image with an alkali metal hypochlorite and having another metal plated thereon by electroless deposition, and the metal plated thereon being selected from the group consisting of nickel, cobalt, iron, copper, chromium, gold, silver, platinum, palladium and mixtures thereof.

3,929,484
COLOR DEVELOPER COMPOSITIONS CONTAINING IMPROVED YELLOW DYE-FORMING COUPLER

Robert E. Ross, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 449,800, March 8, 1974, abandoned. This application July 26, 1974, Ser. No. 492,116
Int. Cl.[2] G03C 7/00
U.S. Cl. 96—55 4 Claims

1. In a color developer composition comprising at least one organic aromatic primary amino developing agent and a yellow-dye-forming coupler material; the improvement which comprises using as said yellow-dye-forming coupler material a compound having the structure:



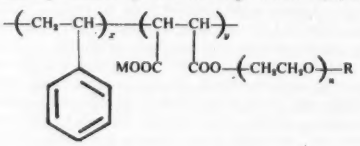
wherein R is a branched alkyl group containing 3 to 6 carbon atoms; X is Cl or Br; Y is X, hydrogen or alkyl (1 to 8 carbon atoms); and A and B differ and are either H or —COOM, wherein M is a photographically inactive cation or a methyl or ethyl group.

3,929,485
DISPERSION OF SILVER HALIDE DEVELOPING AGENT WITH SURFACE ACTIVE POLYMERS OF MALEIC ACID HALF ESTERS

Masami Miyakawa; Masakazu Yoneyama, and Nobuo Yamamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

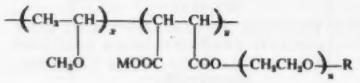
Filed July 26, 1974, Ser. No. 492,312
Claims priority, application Japan, July 26, 1973, 48-84438
Int. Cl.[2] G03C 5/30, 1/48, 1/40, 1/10
U.S. Cl. 96—66 R 54 Claims

1. A silver halide developing agent dispersion which comprises a hydrophilic organic colloid having dispersed therein fine droplets of a silver halide developing agent dissolved in a substantially water-insoluble solvent, and at least one surface active polymer selected from the group consisting of the compounds represented by the following formulae (II) and (III):



(II)

and



(III)

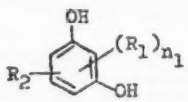
wherein R is a hydrocarbon chain or a fluorine substituted hydrocarbon chain containing 4 to 22 carbon atoms or an aryl group, n is O or an integer of 1 to 40, and M is a hydrogen atom or a cation; and wherein the molar ratio of x to y ranges from 3:1 to 9:1.

3,929,486
SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING A SENSITIZING AND STABILIZING COMBINATION OF A POLYALKYLENE OXIDE, A TETRAZAINDENE AND A RESORCINOL DERIVATIVE

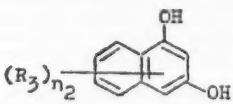
Teiji Habu; Tomio Nakajima; Eiichi Sakamoto; Kenzi Kadokura; Kyusaku Yoshida, and Katsutoshi Machida, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 8, 1974, Ser. No. 467,957
Claims priority, application Japan, May 12, 1973, 48-52094
Int. Cl.[2] G03C 1/28, 1/34
U.S. Cl. 96—76 R 4 Claims

1. A light-sensitive silver halide photographic material which comprises a light-sensitive silver halide emulsion layer and an adjacent layer thereof, at least one of which contains 0.01 to 5 g, per mole of silver halide, of at least one compound selected from polyalkylene oxide compounds; 0.1 to 50g, per mole of silver halide, of at least one compound selected from tetrazaindene compounds; and 0.1 to 50g, per mole of silver halide, of at least one compound represented by the general formula I or II,



I



II

wherein the R_1's are individually hydrogen, halogen, alkyl, aralkyl, alkoxy, acyl, carboxymethyl or a group-COOM or —SO_3M, M is hydrogen, an alkali metal or ammonium R_2 and R_3 are individually group —COOM or —SO_3M; and n_1 and n_2 are individually 1 to 3.

3,929,487
SPECTRAL BALANCING MEANS FOR COLOR PHOTOGRAPHY

Harbans Singh, Box 37, Rte. 1, Odessa, Fla. 33556

Division of Ser. No. 583,789, Oct. 3, 1966, Pat. No. 3,588,215. This application Dec. 7, 1970, Ser. No. 95,901
Int. Cl.[2] G03C 1/84
U.S. Cl. 96—84 R 2 Claims

1. A spectral balancing means for color photography under a fluorescent light source consisting essentially of in combination in a single transfer dye layer a magenta dye and a yellow dye in the ratio of 1:1 to 2:5 coated and applied as one of a single layer and a pellicle onto one of a photographic film base, a photographic emulsion and a photographic material.

3,929,488

LIGHT SENSITIVE DIAZO COMPOSITION WITH AZO DYE FORMED FROM A DIAZONIUM SALT AND A NOVOLAK RESIN

Peter John Smith, Seacroft, England, assignor to Howson-Algraphy Limited, Kent, England

Continuation-in-part of Ser. No. 262,652, June 14, 1972, abandoned. This application June 25, 1974, Ser. No. 483,027

Claims priority, application United Kingdom, June 17, 1971, 28574/71

Int. Cl.² G03F *7/08*; **G03C** *1/54, 1/60*

U.S. Cl. 96—91 R **6 Claims**

1. A light-sensitive positive-working composition which exhibits a colour change upon exposure to light and which is suitable for the production of a printing plate by a photomechanical technique, which composition comprises in admixture a diazonium salt, a novolak resin, and an azo-dye which undergoes a colour change in the presence of the light decomposition products of the diazonium salt, said azo-dye being the product obtained by coupling together a diazonium salt and a novolak resin in alkaline medium.

3,929,489

LITHOGRAPHIC PLATES HAVING RADIATION SENSITIVE ELEMENTS DEVELOPABLE WITH AQUEOUS ALCOHOL

Joseph A. Arcesi, and Frederick J. Rauner, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 14, 1973, Ser. No. 397,179

Int. Cl.² G03C *1/68*; **F01B** *3/00*; **C08G** *63/60*

U.S. Cl. 96—115 R **6 Claims**

1. In a lithographic printing plate comprised of a hydrophilic support means having as a radiation sensitive coated layer thereon a composition comprised of a condensation copolymer said copolymer having first dicarboxylic acid derived repeating units containing non-aromatic vinyl unsaturation capable of providing crosslinking sites for the purpose of insolubilizing said copolymer upon exposure of said composition to actinic radiation, the improvement comprising:

the inclusion within said copolymer of second, aromatic dicarboxylic acid derived repeating units each containing a disulfonamido unit containing a monovalent cation as an amido nitrogen atom substituent thus rendering said copolymer in its unexposed form soluble in an aqueous alkaline developer.

3,929,490

PHOTOPOLYMERIZIABLE COMPOSITIONS WITH POLYMERIC INITIATORS

Ralph H. Reiter, and George Rosen, both of Wayne, N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Mar. 28, 1974, Ser. No. 455,667

Int. Cl.² G03C *1/68*

U.S. Cl. 96—115 P **13 Claims**

1. A photopolymerizable composition consisting essentially of (a) an ethylenically unsaturated monomer and (b) a polymer of an aromatic compound having a polyhaloacyl moiety attached thereto as the photopolymerization initiator.

3,929,491

BONDED SILVER ARTICLE, COMPOSITION, AND METHOD OF BONDING SILVER TO A CERAMIC SUBSTRATE

Baynard R. Smith, and Arnold W. Treptow, both of North Palm Beach, Fla., assignors to Electro Oxide Corporation, Palm Beach Gardens, Fla.

Filed Jan. 24, 1974, Ser. No. 436,352

Int. Cl.² C09D *5/24*

U.S. Cl. 106—1 **16 Claims**

1. A metalizing composition comprising an intimate mixture on a weight basis, of: (a) about 0.5%–5.0% of an initial mixture of cadmium oxide powder and at least one copper oxide powder selected from the group consisting of cuprous oxide and cupric oxide, said copper oxide and cadmium oxide being combined in a weight ratio of between 0.15–6.0 parts of said copper oxide to 1.0 part of said cadmium oxide; (b) about 0.25%–2.0% of at least one particulate material selected from the group consisting of platinum, iridium, rhodium, and osmium powder; (c) about 0.50%–4.0% of rhuthenium oxide; (d) the balance of said intimate mixture being at least one silver particulate material selected from the group consisting of silver and silver oxide; and, said metalizing composition further including about 10.0%–95.0% by weight of said intimate mixture of an organic binder devoid of glass frits.

3,929,492

SURFACE TREATING COMPOSITIONS

Francis E. Chapman, and Robert F. Grant, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 202,599, Nov. 26, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,900

Int. Cl. C08h *9/08*; **C09g** *1/08, 1/14*

U.S. Cl. 106—3 **9 Claims**

1. A self-pressurized surface treating composition comprising a water-in-oil emulsion consisting essentially of about 0.1 to 5% wax, about 0.5 to 10% organic polysiloxane, about 7.5 to 80% of at least one liquified normally gaseous propellant, and water, the continuous phase of said emulsion being free of solvent other than said propellant, and wherein said propellant is selected from the group consisting of liquified normally gaseous hydrocarbon propellants, liquified normally gaseous halogenated hydrocarbon propellants and mixtures thereof.

3,929,493

DENTAL BASE MATERIAL

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Filed Apr. 9, 1974, Ser. No. 459,319

Int. Cl.² C09K *3/00*

U.S. Cl. 106—35 **12 Claims**

1. A dental base material comprised of an organic acid salt of calcium suspended in a network of silica gel.

3,929,494

SEALANT FOR GLASS-CERAMIC SURFACES

Frank Veres, Sylvania Township, Lucas County, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1972, Ser. No. 317,558

Int. Cl.² C04B *33/00*

U.S. Cl. 106—40 R **15 Claims**

1. A foaming sealant for sealing together thermally crystallizable glass or glass-ceramic bodies upon firing of said sealant, said sealant consisting essentially of:

a. about 80–99 weight percent of a glass frit consisting essentially of, in weight percent, 54–80 SiO_2, 14–32 Al_2O_3, 3–8 Li_2O, 0–9 ZnO and 0–7 CeO_2, wherein the mole ratio of $(Li_2O + ZnO) : Al_2O_3$ is from 0.7 to 1.2 and the molar ratio of Li_2O : ZnO is at least 2,

b. zero to 15 weight percent of particulate ZnO,

c. zero to 6 weight percent of particulate CeO_2, and

d. a sufficient amount of particulate SiC which, upon firing of said sealant, will decompose to evolve a gas for foaming said sealant during said firing,

wherein the total ZnO in the sealant is not over 15 weight percent of the sealant and is at least 2 weight percent of the sealant when the CeO_2 component of glass component (a) is less than 2 mole percent thereof; and wherein said CeO_2 in said sealant is in an amount sufficient to effect the decomposition of the said SiC to evolve said gas for foaming said sealant, said amount of CeO_2 being from about 1 to about 7 weight percent.

3,929,495

OPTICAL BORATE GLASS OF HIGH CHEMICAL RESISTANCE AND PROCESS OF MAKING SAME

Heinz Broemer, Hermannstein, and Norbert Meinert, Wetzlar, both of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed May 15, 1973, Ser. No. 360,418
Claims priority, application Germany, May 15, 1972, 2223564
Int. Cl.² C03C *3/14*, *3/00*, *3/30*
U.S. Cl. 106—47 Q 23 Claims

1. An optical borate glass of high chemical resistance, with negative anomalous partial dispersion and refractive indices n_e between 1.65 and 1.79 and Abbe numbers ν_e between 40 and 30, said glass consisting of

between 26 and 39 percent, by weight, of boron trioxide (B_2O_3);

between 32 and 57 percent, by weight, of lead oxide (PbO);

between 5 and 19 percent, by weight, of aluminum oxide (Al_2O_3);

up to 3.0 percent, by weight, of at least one of the oxides of the alkali metals lithium (Li), sodium (Na), and potassium (K), but when present, not less than 2.0 percent, by weight, of said oxides;

up to 8.0 percent, by weight, of zinc oxide (ZnO), but, when present, not less than 0.8 percent, by weight, thereof; up to 600 percent; by weight, of zirconium dioxide (ZrO_2), but, when present, not less than 2.0 percent, by weight, thereof;

up to 15.0 percent, by weight, of tantalum pentoxide (Ta_2O_5), but, when present, not less than 2.0 percent, by weight, thereof; and

up to 16.0 percent, by weight, of a oxide selected from the group consisting of antimony trioxide (Sb_2O_3) and bismuthum trioxide (Bi_2O_3), but, when present, not less than 8.0 percent, by weight, thereof.

3,929,496

HIGH ALUMINA CERAMIC INSULATOR COMPOSITIONS

Toshiyasu Asano, and Kazuyoshi Sumi, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 324,153, Jan. 16, 1973, abandoned. This application Jan. 20, 1975, Ser. No. 542,400
Claims priority, application Japan, Jan. 21, 1972, 47-8657
Int. Cl.² C04B *33/26*
U.S. Cl. 106—46 1 Claim

1. An alumina ceramic insulator for use in a spark plug, formed by sintering at a temperature of 1410°C to 1700°C

a mixture of 80 to 98 percent by weight of alumina of a main constituent and

2 to 20 percent by weight of flux material of an accessory constituent consisting of SiO_2, B_2O_3 and at least one oxide (RO) selected from the group consisting of alkaline earth metal oxides of CaO, MgO, BaO, SrO and BeO and bivalent metal oxides of NiO, CdO, ZnO, MnO, CrO and SnO, said flux material having the following composition range encircled with the points A, B, C and D in the triangular coordinate:

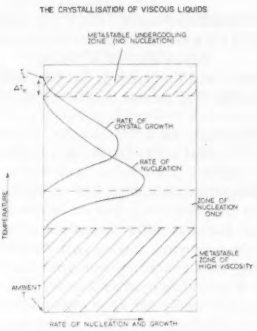
	SiO_2	B_2O_3	RO
A	28.0	60.0	12.0
B	36.0	60.0	4.0
C	89.0	1.0	10.0
D	69.0	1.0	30.0

3,929,497

CRYSTALLIZABLE GLASS SUITABLE FOR FIBER PRODUCTION

Colin Clark-Monks, Sheffield, England, assignor to Fiberglas Canada Ltd., Toronto, Canada

Filed Jan. 31, 1973, Ser. No. 328,467
Int. Cl.² C03C *13/00*, *3/22*; C03B *37/00*, *32/00*
U.S. Cl. 106—50 14 Claims



1. A process for preparing glass fibers which in the vitreous state have a softening point in the range of 650° to 800°C, and in the ceramic state have a softening point in the range of 1040° to 1200°C, which process comprises:

a. compounding conventional glass making raw materials in proportions suitable for yielding glass compositions consisting essentially of:

SiO_2	46.0–48.4 wt. %
Al_2O_3	12.5–13.6 wt. %
CaO	12.0–13.8 wt. %
MgO	8.9–10.6 wt. %
Fe_2O_3	5.0–8.0 wt. %
Na_2O	6.2–7.0 wt. %
TiO_2	2.4–3.5 wt. %
MnO and/or MnO_2	0.3–0.6 wt. %

b. melting said mixture of raw materials in a neutral or oxidizing environment at a temperature in the range of 1200° to 1500°C to obtain an homogeneous glass mass;

c. forming glass from the glass mass into vitreous fibers, which fibers have a softening point in the range of 650° to 800°C, said vitreous fibers being capable, upon subsequent heating to a temperature in the range of 700° to 1035°C, of rapid nucleation and crystallization, without deformation, to a ceramic comprising spinel or diopside as the principal crystal phase.

3,929,498

SINTERED ZIRCONIA BODIES

John Douglas Hancock, Bolton, and Matthew A. Hepworth, Cheadle Hulme, both of England, assignors to Magnesium Elektron Limited, Manchester, England

Continuation of Ser. No. 350,064, April 11, 1973, abandoned. This application Apr. 30, 1975, Ser. No. 465,602

Claims priority, application United Kingdom, Apr. 11, 1972, 16651/72

Int. Cl.² C04B *35/48*

U.S. Cl. 106—57 14 Claims

1. A method of making a sintered zirconia body, which comprises sintering a compacted composition consisting essentially of from 10 to 100% by weight of baddeleyite sand, from 0 to 90% by weight of pure zirconia and zero to 2 mole % yttria stabilizer, at least 10% by weight of the composition having an average grain size not greater than 5 microns.

3,929,499

HIGH WATER-CONTENT WATER IN OIL EMULSION

Frederick L. Thomas, c/o Thomas Chemical Company, 1021 Walsh Road, Madison, Wis. 53714

Continuation-in-part of Ser. No. 287,365, Sept. 8, 1972, which is a continuation-in-part of Ser. No. 116,679, Feb. 18, 1971, abandoned. This application Mar. 8, 1974, Ser. No. 449,540

Int. Cl.² C08L *91/06*

U.S. Cl. 106—268 1 Claim

1. A water in oil emulsion consisting essentially of:

a. about 7.0–15.0% by weight of odorless mineral spirits having a boiling point between about 160° C. and 220° C.;

b. about 0.25–3.0% by weight of a surface active agent comprising principally alkanolamide formed as the condensation product of diethanolamine and oleic acid and having an HLB number between about 2.0 – 6.0;

c. about 0.3–3.0% by weight of a synthetic wax selected from the group consisting of the hydrogenation product of castor oil and N, N′ distearoylethylene diamine having a melting point of about 139°–141° C.; and

d. about 79.0–92.45% by weight of water.

3,929,500

CHROME YELLOW PIGMENT WITH IMPROVED THERMAL STABILITY

James Francis Higgins, Livingston, N.J., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 6, 1974, Ser. No. 521,524

Int. Cl.² C09C *1/20*

U.S. Cl. 106—298 16 Claims

1. In a process for preparing chrome yellow pigment in aqueous medium by contacting an aqueous solution containing soluble salts of chromate and sulfate with a salt of lead to form an aqueous slurry of said pigment and applying at least one hydrous metal oxide to the precipitated pigment,

wherein the improvement comprises adding from 0.2 to 18% by weight of a soluble boron compound to said aqueous medium.

3,929,501

NOVEL TITANIUM DIOXIDE COMPOSITION

Wendell E. Dunn, Jr., Sydney, Australia, assignor to Titanium Technology, N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. Nos. 4,563, Jan. 21, 1970, abandoned, and Ser. No. 138,460, July 12, 1971, abandoned. This application June 4, 1973, Ser. No. 366,547

Int. Cl.² C09C *1/36*

U.S. Cl. 106—300 18 Claims

1. A novel titanium dioxide comprising 95.0 to 99.5 percent, by weight, of titanium dioxide, up to 1.0 percent, by weight of a combination iron oxide and readily chlorinated metal oxides and the remainder silicates and other difficultly chlorinated oxides, said composition of matter having a bulk density in the range of 1.73 to 2.4 grams per cubic centimeter, a hardness (VHN) of 337–650 and a porosity of 0.03 to 0.08 cc/g.

3,929,502

TITANIUM DIOXIDE PIGMENTS AND FILLERS

Jonathan Howard Hodgkin, Burwood; David Geoffrey Hawthorne, South Oakleigh; Jean Drummond Swift, Olinda, and David Henry Solomon, Glen Waverley, all of Australia, assignors to Commonwealth Scientific & Industrial Research Organization, Campbell, Australia

No Drawing. Division of Ser. No. 224,606, Feb. 8, 1972, Pat. No. 3,834,923. This application Feb. 19, 1974, Ser. No. 443,795

Claims priority, application Australia, Feb. 10, 1971, 3979/71; Feb. 10, 1971, 3981/71; Feb. 10, 1971, 3983/71; Feb. 10, 1971, 3985/71

Int. Cl. C09c *1/36*

U.S. Cl. 106—300 11 Claims

1. A process for the production of polymer-coated titanium dioxide particles comprising polymerizing a monomer capable of acid-catalysed polymerization in the presence of titanium dioxide particles coated with an aluminium compound and having on their surface a number of acidic sites with a pKa value below 2.8.

3,929,503

PRODUCTION OF FREE-FLOWING PARTICLES OF GLUCOSE, FRUCTOSE OR THE MIXTURE THEREOF

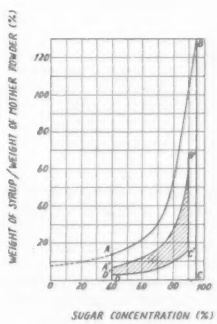
Toshio Yamauchi, Kyoto, Japan, assignor to Daiichi Seiyaku Co., Ltd., Kyoto, Japan

Filed May 31, 1974, Ser. No. 475,198

Claims priority, application Japan, June 4, 1973, 48-63250

Int. Cl.² C13K *1/00, 9/00*

U.S. Cl. 127—58 13 Claims



1. A method for preparing anhydrous, free-flowing solid particles of a sugar selected from the group consisting of glucose, fructose and admixtures thereof, which comprises:

a. kneading an anhydrous powder of said sugar with a 40–90% by weight solution of said sugar in an amount of 5–65% by weight of said powder within the area shown between points A, B, C and D of the attached Drawing without subjecting said solution to a crystallization step to form a kneaded mixture having a moisture content of less than 7% by weight;

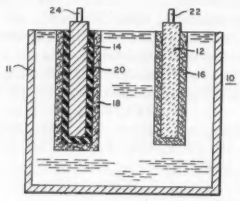
b. shaping said kneaded mixture into particles; and

c. drying the shaped particles at a temperature lower than 70° C. to form anhydrous particles.

3,929,504
RECHARGEABLE POWER SOURCE

Jon S. Gore, Lansdale, and Charles R. Walk, Collegeville, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 18, 1974, Ser. No. 534,042
Int. Cl.² H01M *10/00*
U.S. Cl. 136—6 LN 5 Claims

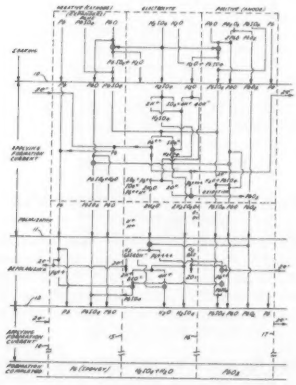


1. A secondary energy cell capable of operating in the discharge mode and in the charge mode, comprising:
a lithium anode;
a vanadium pentoxide cathode;
an electrolyte including lithium perchlorate dissolved in propylene carbonate; and
means for enclosing at least one electrode, said means having a permeability to permit passage of electrolyte ions and prevent migration of lithium metal from said anode.

3,929,505
FORMATION OF BATTERY PLATES

Wilford B. Burkett, Pacific Palisades, and Joseph A. Orsino, Calabasas Park, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Continuation of Ser. No. 136,833, April 23, 1971, abandoned.
This application June 27, 1973, Ser. No. 374,265
Int. Cl.² H01M *35/30*
U.S. Cl. 136—34 14 Claims

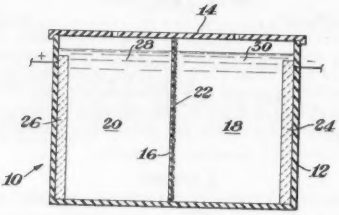


10. A method of electrochemically forming battery plates comprising:
immersing unformed battery plates in an electrolyte;
passing a formation current through the plates and electrolyte; and,
intermittently reversing the current through the plates and electrolyte for an interval of time sufficient to depolarize the plates and electrolyte without significantly discharging the battery.

3,929,506
ZINC-BROMIDE SECONDARY CELL

James J. Leddy, and Gerhard Gritzner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1973, Ser. No. 361,745
Int. Cl.² H01M *4/86*
U.S. Cl. 136—86 A 16 Claims

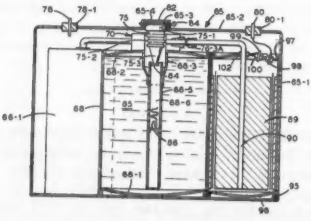


1. A method of operating a zinc-bromide secondary cell divided into anode and cathode compartments by a zinc cation ion exchange diaphragm comprising adding a catholyte consisting essentially of an aqueous solution of at least one salt selected from the group consisting of ammonium bromide and the bromides of lithium, sodium, potassium, beryllium, magnesium, calcium and strontium to the cathode compartment with a cathode disposed therein; adding an anolyte consisting essentially of an essentially bromide ion free, aqueous solution containing at least one salt selected from the group consisting of zinc chlorate, zinc chloride, zinc iodide, zinc tetrafluoroborate, zinc fluorosilicate and zinc nitrate to the anode compartment with an anode disposed therein; impressing an electromotive force between the anode and the cathode to deposit metallic zinc on the anode, release bromine at the cathode and pass substantially only cations through the diaphragm into the anode compartment.

3,929,507
MULTI CELL RESERVE BATTERY

Per Bro, Andover; Robert H. Kelsey, Acton, and Nikola Marincic, Winchester, all of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Aug. 22, 1973, Ser. No. 390,677
Int. Cl. H01m *21/00*
U.S. Cl. 136—114 3 Claims



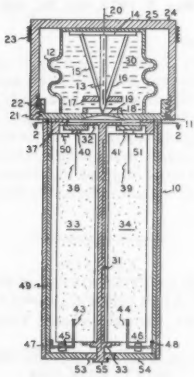
1. A reserve battery comprising
1. an anode,
2. a cathode,
3. a separator between said anode and said cathode, with space between and around said anode and cathode to accomodate an electrolyte; and
4. a closed case for said cell;

a container external to said cell case for holding a quantity of electrolyte for said cell;
a conduit system providing a passage between said electrolyte container and said cell case;
a conduit system includes a first conduit extending through a wall of said electrolyte container, said first conduit being open at its inner end to communicate with the electrolyte in said container, and said first conduit being closed at its outer end outside of said container by a frangible closure;
and said conduit system also includes a second conduit which extends into said cell through a wall of said cell case and has its outer end outside of said cell case;
and a closed box enclosing said outer closed end of said electrolyte container conduit;
said box having one wall constructed as a collapsible bellows;
and activating means including a puncturing element supported on said bellows and aimed at said frangible closure, and said puncturing element being movable inwardly through operation of said bellows, to puncture said frangible closure; and said box having a second wall supporting a hollow coupling for coupling onto the outer end of said second conduit leading to said cell case; whereby, upon a fracturing puncture of said frangible closure, the electrolyte, under its vapor pressure and the added pressure of an inert driving gas, in its container, will be pushed through said conduit system into said cell case.

3,929,508
RESERVE BATTERY

William Carl Merz, Delaware, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 15, 1974, Ser. No. 451,621
Int. Cl.² H01M 2/10
U.S. Cl. 136—114 **7 Claims**



1. An improved reserve battery comprising;
a. a battery housing;
b. an anode structure within said housing;
c. a cathode structure within said housing;
d. a dry material cell within said housing between said anode and said cathode and filled with a dry material;
e. a diaphragm permanently attached to said battery housing;
f. a collapsable solvent container structure mountably attached to said diaphragm, said solvent container structure being sealed from said housing by said diaphragm when said solvent container structure is mountably attached to said diaphragm;
g. means to collapse said solvent container; and
h. a solvent in said solvent container structure and means within said solvent container structure for providing access to said housing so that upon demand said liquid in said solvent container structure can be dispersed within the dry material cell between said anode structure and said cathode structure so that said liquid and said dry material react chemically to provide electrical current from said anode and said cathode structures.

3,929,509
HYDROPHILIC MICROPOROUS FILM

Henry T. Taskier, Englewood, N.J., assignor to Celanese Corporation, New York, N.Y.

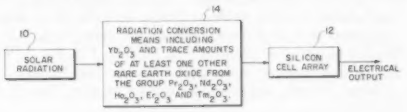
Division of Ser. No. 245,260, April 18, 1972, Pat. No. 3,853,601. This application Mar. 1, 1974, Ser. No. 447,184
Int. Cl.² H01M 2/14
U.S. Cl. 136—146 **2 Claims**

1. In a battery comprising at least one electrolytic cell, said cell including an anode and a cathode disposed in an electrolyte said anode and cathode separated in said electrolyte by a battery separator the improvement comprising the battery separator, said separator comprising a hydrophobic, microporous polymeric film characterized by a reduced bulk density compared to the bulk density of the corresponding non-porous precursor film, a crystallinity of above about 30 percent, an average pore size of about 100 to 12,000 Angstroms, a surface area of about 2 to about 200 square meters per gram, and a void volume of between about 20 to 45 percent; and a surfactant coating comprising about 2 to 20 percent by weight of the uncoated microporous film, of polyoxethylene polymethyl siloxane.

3,929,510
SOLAR RADIATION CONVERSION SYSTEM

Emil Kittl, Locust, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,321
Int. Cl.² H01L 35/02
U.S. Cl. 136—206 **6 Claims**


14
10
SOLAR RADIATION
RADIATION CONVERSION MEANS INCLUDING Yb_2O_3 AND TRACE AMOUNTS OF AT LEAST ONE OTHER RARE EARTH OXIDE FROM THE GROUP Pr_2O_3, Nd_2O_3, Ho_2O_3, Er_2O_3 AND Tm_2O_3
12
SILICON CELL ARRAY
ELECTRICAL OUTPUT

1. A system for converting solar radiation into useful electrical energy, said system comprising a silicon cell and solar radiation conversion means, said solar radiation conversion means comprising ytterbium oxide and small amounts of at least one other rare earth oxide selected from the group consisting of praseodymium oxide, neodymium oxide, holmium oxide, erbium oxide, and thulium oxide.

3,929,511
THERMOCOUPLE ASSEMBLY

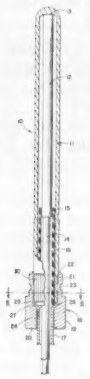
Ralph E. Solomon, Upland, Calif., assignor to Jade Controls, Inc., Upland, Calif.

Filed Feb. 25, 1974, Ser. No. 445,575
Int. Cl.² H01L 1/02
U.S. Cl. 136—228 **12 Claims**

8. A thermocouple device comprising
a member of electrically conductive material having a bore therethrough and a laterally directed surface in said bore, a length of tubing of electrically conductive material, said tubing having a laterally directed end portion engaging said laterally directed surface of said member,
and a thermocouple tip of electrically conductive material, said tip having an end portion received in said bore with

said member at said bore gripping the periphery of said end portion,

said end portion of said tip having a surface engaging said laterally directed end portion of said tubing and holding the same against said laterally directed surface of said member, whereby an electrical and mechanical connection is provided between said thermocouple tip and said tubing.



3,929,512

SEMICONDUCTOR DEVICES

Keith Harlow Nicholas, Reigate; Ronald Alfred Ford, Crawley, and Julian Robert Anthony Beale, Reigate, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 204,229, Dec. 2, 1971. Pat. No. 3,796,929. This application Sept. 10, 1973, Ser. No. 395,912

Claims priority, application United Kingdom, Dec. 9, 1970, 58478/70

Int. Cl.[2] H01L *21/00*

U.S. Cl. 148—1.5 **12 Claims**

1. A method of manufacturing a semiconductor device having a region of one type conductivity in a semiconductor body portion of the opposite type conductivity and forming a junction with the semiconductor body portion, said one type region having a high sheet resistance and constituting the resistance region of a resistor of the semiconductor device, said device being processed by steps including effecting spaced contacts to the resistance region whereby when a voltage is applied to the contacts the resistor exhibits a voltage linearity determined by its measured resistance as a function of applied voltage, said processing also comprising the step of bombarding said semiconductor body portion with neutral ions to implant in the body at least where the junction is to be or is formed a high concentration of neutral ions and associated semiconductor crystal lattice damage, the concentration of implanted neutral ions and associated semiconductor crystal lattice damage in the resistance region of the finished device after the processing, at least in the vicinity of the said junction, being so high that the effective mobility of majority charge carriers in the resistance region in the vicinity of the said junction is at most one-third of the value in the absence of the implanted neutral ions and associated damage whereby the resistor exhibits improved voltage linearity.

3,929,513

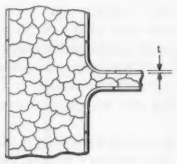
LEAD ALLOY PRODUCTS

George W. Mao, St. Paul, Minn., assignor to Gould Inc., Mendota Heights, Minn.

Continuation-in-part of Ser. No. 749,257, July 25, 1968, abandoned. This application July 14, 1971, Ser. No. 162,605

Int. Cl. C22f *1/12*; H01m *35/08*

U.S. Cl. 148—3 **8 Claims**



1. A method of producing an essentially monograined layer along the outer surface of a pressure cast lead alloy product, comprising the steps of:

a. alloying lead with calcium ranging from 0.05 percent to 0.07 percent by weight;

b. pressure casting the lead alloy to form a product;

c. annealing said product at a temperature in a range of 450° F. to 550° F. for approximately six hours, followed by

d. quenching said product.

3,929,514

COMPOSITION AND METHOD FOR FORMING A PROTECTIVE COATING ON A ZINC METAL SURFACE

William F. Houlihan, deceased, late of Springfield, Mass. (by Rosemary Houlihan, executrix); Isaac Laird Newell, Wethersfield, Conn., and Gerald E. La Cosse, Chicopee, Mass., assignors to Heatbath Corporation, Springfield, Mass.

Filed Mar. 5, 1974, Ser. No. 448,371

Int. Cl.[2] C23F *7/00*

U.S. Cl. 148—6.14 **13 Claims**

1. A method for forming a protective coating on a zinc metal surface which comprises contacting said surface with an aqueous solution which consists essentially of an inorganic water soluble alkaline compound, at least one metal ion selected from the group consisting of cadmium, manganese, aluminum, tin, titanium, molybdenum, chromium, tungsten, cobalt, ferrous and ferric iron and, nickel and triethanolamine hydrochloride in an amount sufficient to hold said metal ions in solution.

3,929,515

METHOD FOR CUTTING OVERLAPPING METAL PLATES WITH GAS HEAT

Kozo Sato, No. 7-12, Minami 3-chome, Yamamoto-cho, Yao, Osaka, Japan

Filed Sept. 27, 1974, Ser. No. 510,009

Int. Cl.[2] B23K *7/08*

U.S. Cl. 148—9 R **3 Claims**

1. A method of heat-cutting stacks of overlapping metal plates with gas heat so that notwithstanding gaps in the plates or warping of the plates, the gas heat applied to an outer plate will rapidly penetrate the entire stack comprising applying to the contacting surfaces of the plates a filler material consisting of:

a. 75 percent alginate soda;

b. 20 percent of a vinyl acetate denaturant;

c. 1 percent of a surface-tension reducing surface-active agent;

d. 3 percent of a non-ion chelating agent;

e. 1 percent of a dispersity stabilizing surface-active agent;

f. 11 percent of the forgoing components being mixed

with a 2 percent solution of amine naphthenate soap; and, heat-cutting the stacked metal plates.

3,929,516

PROCESS FOR PRODUCING CU-BASE ALLOYS

Harvey P. Cheskis; Stanley Shapiro, both of New Haven, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 30, 1974, Ser. No. 501,990
Int. Cl.² C22D *1/08*
U.S. Cl. 148—11.5 R 22 Claims

1. A method for producing blister free copper alloy material using as a starting material a copper alloy which has been hot worked at least 50 percent to a thickness of from 0.200 to 0.750 inch including the steps of:

A. annealing the copper alloy material at a temperature of from 40 to 70 percent of the absolute melting temperature of the alloy for a time of from 1 to 24 hours; and

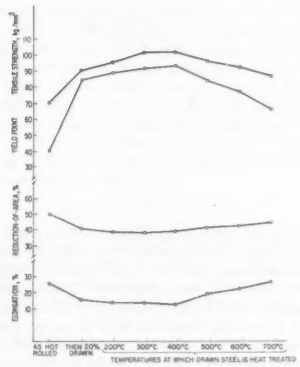
B. cold working the material at least 60 percent.

3,929,517

PROCESS FOR PRODUCING A STEEL HAVING A SUPERB COMBINATION OF HIGH STRENGTH AND SUBSTANTIAL TOUGHNESS

Yoshimi Nakamura; Toshihiro Minami, both of Kobe; Eizi Niina, Nishinomiya, and Katuzi Mizutani, Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed July 9, 1973, Ser. No. 377,634
Claims priority, application Japan, July 7, 1972, 47-67958; Aug. 24, 1972, 47-84891
Int. Cl.² C21D *7/02*
U.S. Cl. 148—12 F 9 Claims



EFFECT OF THE TEMPERATURE OF THE TREATMENT PROCESS OF THE INVENTION

1. A process for producing a carbon steel or low alloy steel having a combined ferrite and pearlite structure, which is characterized by high strength and toughness, which comprises the steps of

subjecting said steel to cold working whereby the area of said steel is reduced to at least 10 %.

rapidly heating said steel to a temperature in the range of 450°C to the A_1 transformation point, and rapidly cooling said steel wherein the period at which said steel is held at the heating temperature is less than 3 minutes and wherein the heating rate is at least 50°C/min.

3,929,518

HIGH SPEED STEEL HAVING HIGH WEAR RESISTANCE

Kimihiko Akahori, Katsuta, and Masayuki Era, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 23, 1974, Ser. No. 435,952
Claims priority, application Japan, Jan. 24, 1973, 48-9543
Int. Cl.² C22C *38/12*, *38/36*
U.S. Cl. 148—31 11 Claims

1. A high speed steel having high wear resistance consisting essentially of 3.1 to 6.3% by weight of carbon, 5 to 12% by weight of vanadium, 3 to 10% by weight of niobium, and the balance essentially iron, wherein all of vanadium and niobium is combined with carbon, 1.4 to 3.6% by weight of carbon forms cementite in the form of ternary-component eutectic crystals of carbides of vanadium and niobium, γFe and Fe_3C and 0.1 to 0.6% by weight of carbon is dissolved in a ferrous matrix as hardened and wherein the weight ratio of niobium to vanadium is from 0.5 to 1.

3,929,519

FLEXIBLE COBALT-RARE EARTH PERMANENT MAGNET PRODUCT AND METHOD FOR MAKING SAID PRODUCT

Mark G. Benz, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 410,621, Oct. 29, 1973, abandoned. This application Aug. 9, 1974, Ser. No. 496,064
Int. Cl.² H01F *1/04*
U.S. Cl. 148—31.57 8 Claims

7. A bendable cobalt-rare earth alloy permanent magnet product in the form of a tape or strip consisting essentially of a non-magnetic flexible substrate having bonded to a single side thereof a number of brittle sintered cobalt-rare earth alloy magnetic members in juxtaposition, wherein each member consists essentially of cobalt-rare earth alloy and contains the Co_5R soild intermetallic phase in an amount of at least 70 percent by weight of the sintered member, where R is a rare earth metal or metals, and wherein each said member has its easy axis of magnetization aligned perpendicular to the plane of the substrate, said substrate being in the form of a tape or strip at least as wide as the sintered member, each one foot length of said substrate being flexible longitudinally through an arc of at least 45° without rupturing, each said sintered member being a body of compacted particles having a density of at least 87 percent of theoretical, a thickness ranging from 0.01 inch to 0.5 inch, and having a size which allows each one foot length of said product to be bent longitudinally in at least a single direction through an arc of at least 45° without rupture.

3,929,520

CORROSION-RESISTANT AUSTENITIC-FERRITIC STAINLESS STEEL

Lars Ivar Hellner, Knektasvagen 31, S-691 00 Karlskoga, and Lars-Åke Norström, Villavagen 14, S-683 00 Hagfors, both of Sweden

Continuation-in-part of Ser. No. 317,494, Dec. 21, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,132
Claims priority, application Sweden, Dec. 23, 1971, 16555/71
Int. Cl.² C22C *38/02*, *38/44*
U.S. Cl. 148—37 2 Claims

1. Corrosion-resisting austeniticferritic stainless steel having an austenite content of between 10% and 25% by volume and a ferrite content of between 90% and 75% by volume, said steel having high tensile strength, high ductility and impact strength, high general corrosion resistance, high resistance to stress corrosion in chloride solutions, and high resistance to intergranular corrosion in warm chloride solutions, said steel consisting essentially of (percent by weight):

C max	0.15
Si	2.0 – 4.0
Mn	0.5 – 3.0
Cr	23 – 27
Ni	3.5 – 8.0
Mo	0.5 – 2.0
N max	0.1

and the balance substantially iron.

3,929,521

SOLUBILIZATION OF CHROMATE SALTS IN ORGANIC MEDIA

Jack Ohr, and Kenneth G. Clark, both of Warminster, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 2, 1974, Ser. No. 511,328
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.2 **27 Claims**

1. A corrosion inhibitor for mixing with an organic medium, produced by the process comprising:

contacting an aqueous solution of hexavalent chromium-containing potassium salt with an organic solution of 18-crown macrocyclic polyether selected from the group consisting of dibenzo-18-crown-6; dicyclohexyl-18-crown-6 and 18-crown-6 macrocycles until equivalent molar amounts of said salt and said polyether are complexed in said organic solution, said aqueous solution having a molarity essentially from 0.1 mol to saturation and an acidic pH, and

said organic solution having a molarity essentially from 0.0004 mol to 0.7 mol; and

separating said organic solution containing said complexed salt and polyether and forming thereby said inhibitor.

3,929,522

PROCESS INVOLVING COOLING IN A STATIC ATMOSPHERE FOR HIGH PERMEABILITY SILICON STEEL COMPRISING COPPER

James A. Salsgiver, Sarver, and Frank A. Malagari, Freeport, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Nov. 18, 1974, Ser. No. 524,846
Int. Cl.² H01F 1/04
U.S. Cl. 148—112 **16 Claims**

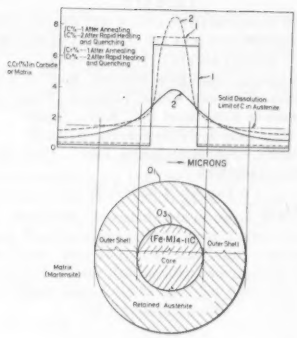
1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a peremeability of at least 1850 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel; casting said steel; hot rolling said steel into a hot rolled band; subjecting said steel to at least one cold rolling; subjecting said steel to a final annealing prior to the final cold rolling; decarburizing said steel; and final texture annealing said steel; the improvement comprising the steps of carrying out said final anneal prior to the final cold rolling at a temperature of from 1400 to 2150°F for a period of from 15 seconds to 2 hours; cooling said steel from a temperature below 1700°F and above 750°F to a temperature at least as low as 500°F with a liquid quenching medium or gaseous stream and from its maximum annealing temperature to said temperature below 1700°F and above 750°F at a rate which is no faster than one wherein the steel is cooled in a static atmosphere or in a continuous processing line where there is some relative motion between the atmosphere and the steel, although the only deliberate motion is that imparted to the steel; and cold rolling the cooled steel at a reduction of at least 80%; said melt consisting essentially of, by weight, up to 0.07% carbon, from 2.60 to 4.0% silicon, from 0.03 to 0.24% manganese, from 0.01 to 0.09% of material from the group consisting of sulfur and selenium, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, from 0.1 to 0.5% copper, from 0.00045 to 0.0035% boron, balance iron.

3,929,523

STEEL SUITABLE FOR USE AS ROLLING ELEMENTS

Masao Kinoshi, Fujisawa, and Kyozarburo Furumura, Chigasaki, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 297,644, Oct. 16, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,597
Int. Cl.² C21D 1/18
U.S. Cl. 148—143 **5 Claims**



2. A method for producing steel for rolling elements which comprises heating a steel material to a predetermined temperature between about 1000° and 1250°C at an average heating rate of more than 10°C/sec. above 850°C and quenching the thus heated steel material to obtain a steel wherein the surface layer has a martensite structure with 15 to 80 volume % of quasi-carbide particles distributed through the martensite structure, said particles being in the size range from about 0.2 to 10 microns and having a core portion and an outer shell portion, said core portion having a carbon content of about 2 to 5% and said outer portion being composed of retained austenite and having a carbon content which decreases continuously toward the outer shell portionn portion which further possesses lower carbon and chrome contents than cementite, the surface layer of said steel starting material consisting essentially of the following chemical composition;

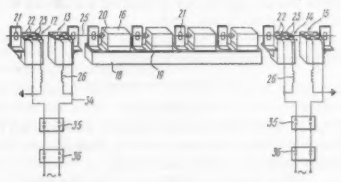
C, 0.65 – 1.4%; Mn, 0.04 – 1.5%; Si, 0.04 – 2.0%, one member selected from the group consisting of 0.06 – 0.6% Mo; 0.30 – 2.5% Cr, and a combination of 0.06 – 2.5% Cr and 0.06 – 0.6% Mo wherein Cr + Mo 0.2%, the balance being iron and unavoidable impurities, said surface layer containing 5 – 40 volume % of granular carbide composed mainly of cementite at a temperature below 850°C.

3,929,524

METHOD OF HEAT TREATING LINEAR LONG-LENGTH STEEL ARTICLES, APPARATUS FOR EFFECTING SAID METHOD AND ARTICLES PRODUCED THEREBY

Nikolai Grigorievich Filatov, ulitsa M. Gorkogo, 41, kv. 78, Orel; Jury Yakovlevich Meshkov, ulitsa Vernadskogo, 75A, kv. 21, Kiev; Nikolai Fedorovich Chernenko, Bulvar Lepse, 48/24, kv. 57, Kiev; Dmitry Iosifovich Nikonenko, ulitsa Dobrokhotova, 7, kv. 156, Kiev; Felix Isaakovich Mashlenko, M. Bronnaya ulitsa, 22/15, kv. 21, Moscow; Albert Mikhailovich Belyaev, ulitsa Bolotnikovskaya, 39, kv. 22, Moscow; Artur Khadyevich Valeev, proezd Rusanova, 11, korpus 1, kv. 68, Moscow; Valentina Alexandrovna Savina, Denisovsky perevlok, 14, kv. 14, Moscow; Vladimir Zakharovich Marchenko, prospekt Kanatchikov, 6, kv. 55; Valery Ionovich Fedorov, prospekt Kanatchikov, 3, kv. 8, both of Volgograd; Vitaly Nikiforovich Gridnev, ulitsa K. Libknekhta 36, kv. 15, Kiev, and Konstantin Vasilievich Mikhailov, Zelenodolskaya ulitsa, 16, kv. 57, Moscow, all of U.S.S.R.

Filed July 26, 1973, Ser. No. 382,850
Int. Cl.[2] C21D *9/62*, *1/40*
U.S. Cl. 148—150 3 Claims



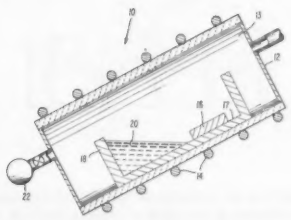
1. A method of heat-treating linear, long-length steel articles comprising: electrical resistance heating steel stock to an austenitizing temperature, cooling the said steel stock to effect martensitic hardening and subsequently electrical resistance temper-heating said stock to a temperature of 300° to 700°C at a rate of 50° to 3000°C/second, said heat treatment being conducted while continually transferring said stock from one heat treating operation to another at a speed of 10–300 m/minute; said method being further characterized in that said steel stock is electrically isolated between the austenitizing and temper-heating zones by passing said steel stock through at least one ferromagnetic core means located between the last current lead of the austenitizing zone and the first current lead of the temper-heating zone.

3,929,525

METHOD OF FORMING OHMIC CONTACTS

Frank Zygmunt Hawrylo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,850
Int. Cl.[2] H01L *7/38*
U.S. Cl. 148—171 10 Claims



1. A method of providing an ohmic contact on a semiconductor body comprising:

preparing a solution in which gallium arsenide and a conductivity modifier are dissolved in indium such that the solution is saturated with said gallium arsenide;

contacting said solution to a body of single crystal gallium arsenide of high resistivity; and

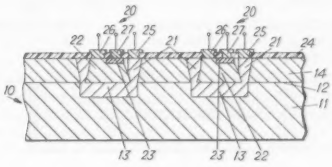
cooling said solution such that an indium gallium arsenide alloy is deposited on said body of single crystal gallium arsenide.

3,929,526

METHOD OF MAKING SEMI-CONDUCTOR DEVICES UTILIZING A COMPENSATING PREDIFFUSION

Roy Nuttall, Cheadle, and Clifford Rowbotham, Poynton, both of England, assignors to Ferranti, Limited, Hollinwood, England

Filed Feb. 7, 1973, Ser. No. 330,406
Int. Cl.[2] H01L *21/22*, *27/04*, *21/76*
U.S. Cl. 148—175 10 Claims



1. A method of manufacturing a semiconductor device includes forming a semiconductor body by providing a semiconductor substrate of one conductivity type, forming in a first diffusion step a heavily doped region of opposite conductivity type adjacent to selected parts of one surface of the substrate, diffusing into said surface of the substrate in a second diffusion step a conductivity-type-determining impurity to provide an impurity characteristic of said one conductivity type, and subsequently depositing semiconductor material on said surface of the substrate to form an epitaxial layer of said one conductivity type from an atmosphere having as a constituent a conductivity-type-determining impurity of said one conductivity type, the epitaxial deposition being obtained solely by modifying the conditions under which the second diffusion step was performed such that the atmosphere above the substrate during the epitaxial deposition also contains a source of the semiconductor material of the epitaxial layer, there being inherently an interface region having a thickness in the range of 10 to 1000A between the bulk of the substrate and the bulk of the epitaxial layer deposited on the substrate, the properties of the interface region being determined by the diffusion of the conductivity-type-determining impurity providing an impurity characteristic of said one conductivity type.

3,929,527

MOLECULAR BEAM EPITAXY OF ALTERNATING METAL-SEMICONDUCTOR FILMS

Leroy L. Chang, Lake Mohegan; Leo Esaki, Chappaqua, and Rudolf Ludeke, Millwood, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 11, 1974, Ser. No. 478,195
Int. Cl.[2] H01L *21/203*, *21/84*
U.S. Cl. 148—175 4 Claims

1. Method of growing alternately repeated layers of aluminum epitaxy on semiconductor substrates selected from the group consisting of GaAs, AlAs and pseudobinary alloys of GaAs and AlAs of the formula $Ga_{1-x}Al_xAs$ and semiconductor epitaxy selected from the group consisting of GaAs, AlAs and pseudobinary alloys of GaAs and AlAs of the formula $Ga_{1-x}Al_xAs$ on said aluminum epitaxy layer in an ultra-high vacuum evaporation system including the steps of

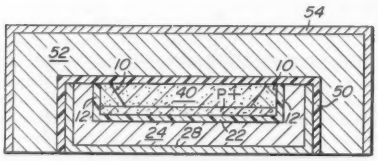
a. depositing the aluminum film on the clean surface of the semiconductor substrate over the temperature range between room temperature and 400°C; and
b. depositing the semiconductor film on the clean surface of the aluminum over the temperature range between 500°C and 600°C.

3,929,528

FABRICATION OF MONOCRIPTALLINE SILICON ON INSULATING SUBSTRATES UTILIZING SELECTIVE ETCHING AND DEPOSITION TECHNIQUES

Uryon S. Davidson, deceased, late of Scottsdale, Ariz.; by Amil J. Ajamie, administrator, and James B. Price, both of Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Jan. 12, 1973, Ser. No. 323,011
Int. Cl.² H01L *21/20, 21/306, 21/76*
U.S. Cl. 148—175 **14 Claims**



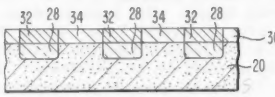
1. A method of manufacture for providing a thin layer of high quality monocrystalline silicon on an insulating substrate to form a starting material in which monolithic integrated circuits having high frequency active devices can be fabricated, such method comprising:
providing a silicon wafer having a predetermined crystallographic orientation and first and second surfaces;
forming a layer of boron doped silicon having a first surface of a first concentration of dopant adjacent said first surface of said silicon wafer and an exposed second surface having a second concentration of dopant, said layer of doped silicon having an intermediate portion between said first and second surfaces having a concentration of dopant intermediate said first and second concentrations, said intermediate concentration being selected to retard the etch rate of a selective etchant;
forming a first layer of insulating material over said surfaces of said silicon wafer and said layer of doped silicon;
forming a first supporting layer over a portion of said first layer of insulating material;
exposing said second surface of said silicon wafer;
applying a selective etchant to said second surface of said silicon wafer, said etchant removing said silicon wafer at a first rate until a portion of said silicon near said intermediate portion of said layer of doped silicon is exposed, said concentration of dopant of said remaining boron doped silicon being selected to have an etch rate which is substantially less than said first etch rate;
epitaxially forming the thin layer of monocrystalline silicon on said exposed surface of said layer of doped silicon, said thin layer of monocrystalline silicon having a first surface and an exposed surface;
forming a second layer of insulating material over said exposed surface of said thin layer of monocrystalline silicon;
forming a second supporting layer over said second layer of insulating material; and
selectively removing portions of said first supporting layer, said first layer of insulating material and said layer of doped silicon to expose a surface of said thin layer of monocrystalline silicon through which field effect and bipolar devices can be fabricated.

3,929,529

METHOD FOR GETTERING CONTAMINANTS IN MONOCRYSTALLINE SILICON

Michael R. Poponiak, Newburgh, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1974, Ser. No. 530,910
Int. Cl.² H01L *7/52*
U.S. Cl. 148—191 **12 Claims**



1. A method for removing fast diffusing metal contaminates from a monocrystalline silicon body comprising:
anodizing at least one side of said body in an aqueous liquid bath under conditions that result in the formation of a layer of porous silicon,
annealing the resultant structure in a nonoxidizing environment at a temperature and a length of time sufficient to diffuse the contaminates of interest a distance at least the thickness of the body, and
exposing the body to an oxidizing environment to oxidize said porous silicon layer to SiO_2.

3,929,530

PYROTECHNIC DISSEMINATING FORMULATION

Earl Thomas Niles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1966, Ser. No. 596,008
Int. Cl.² C06D *3/00*
U.S. Cl. 149—84 **6 Claims**

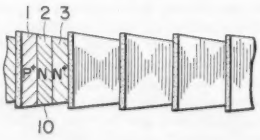
1. A pyrotechnic disseminating formulation comprising
a. from about 6 to about 23 weight per cent of an aminosubstituted thiourea as fuel,
b. from about 20 to about 36 weight per cent of a member selected from the group consisting of alkali metal and ammonium chlorates and perchlorates as oxidizer, and
c. balance an agent to be disseminated selected from the group consisting of smoke producing organic dyes, tear gas, herbicides, fungicides, pesticides, and psychotomimetic incapacitating agents.

3,929,531

METHOD OF MANUFACTURING HIGH BREAKDOWN VOLTAGE RECTIFIERS

Hirotsugu Hattori, and Yuichiro Takayama, both of Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed May 14, 1973, Ser. No. 360,080
Claims priority, application Japan, May 19, 1972, 47-51435
Int. Cl.² H01L *21/304, 21/306*
U.S. Cl. 156—3 **2 Claims**



1. A method of manufacturing high breakdown voltage rectifiers comprising the steps of cutting a silicon wafer lamination consisting of a plurality of silicon wafers each having a P-N junction formed therein along planes perpendicular to the principal surface of the silicon wafers into slices of the lami-

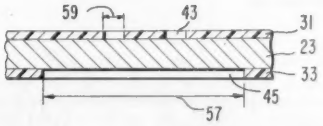
nated block, each of said slices of the laminated block consisting of a plurality of diodes connected in series, and subjecting said slices of the laminated block to an etching treatment with a blend etching liquid composed of hydrofluoric acid with a concentration of about 48 weight percent, nitric acid with a specific gravity of 1.420 and glacial acetic acid in a volume ratio of 2:4:1, thereby rendering each of said plurality of diodes into a bevel diode.

3,929,532

METHOD FOR ETCHING APERTURED WORK PIECE

Henry William Kuzminski, Ephrata, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 17, 1974, Ser. No. 489,393
Int. Cl.² B29C *17/08*
U.S. Cl. 156—11 **9 Claims**



1. A method for producing an array of tapered apertures in a thin metal sheet comprising

a. coating opposite major surfaces of said sheet with etch-resistant patterns, the pattern on one major surface comprising an array of open areas surrounded by etch-resistant material. and the pattern on the opposite major surface comprising open areas of smaller shape but smaller than the open areas on said one major surface and registered with said larger open areas, each of said smaller open areas having therein a solid area of etch-resistant material that is still smaller than said smaller open area, each still-smaller solid area being continuous and unbroken by open areas,

b. simultaneously etching both sides of said coated sheet until said tapered apertures are produced in said sheet,

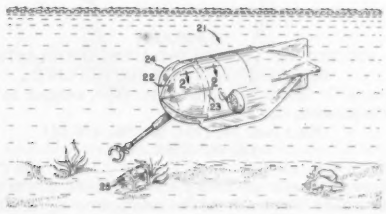
c. and then removing said etch-resistant patterns from both major surfaces of said sheet.

3,929,533

METHOD OF ASSEMBLING A GLASS SPHERICAL SEGMENT VIEWING PORT TO A SUBMARINE VESSEL

George M. Horn, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1974, Ser. No. 520,087
Int. Cl.² E04F *13/00*
U.S. Cl. 156—71 **5 Claims**



1. In a method of making a panoramic viewing aperture for a deep submersible vehicle which comprises the steps of,

placing a glass dome in contact with a mounting ring,

lapping said glass dome into mating surface contact with said mounting ring,

cleaning said glass dome and mounting ring,

treating a suitably dimensioned titanium gasket to improve epoxy cement bonding therewith,

coating an asbestos gasket, said titanium gasket and the lapped surfaces of said glass dome and mounting ring with epoxy cement,

the improvement comprising:

assembling the glass dome, mounting ring, titanium gasket, and asbestos gasket such that the titanium gasket is juxtaposed with said glass dome and said asbestos gasket with said mounting ring and the gaskets in mutual contact in a substantially horizontal position such that the joint therebetween extends vertically;

preloading said assembly with a predetermined compressing force to force the component parts into mating engagement;

curing said preloaded assembly while maintaining said compressive force for a predetermined time and at a controlled temperature to cause the epoxy cement to bind said components into a unitary assembly;

increasing the preload pressure means to a predetermined amount; and

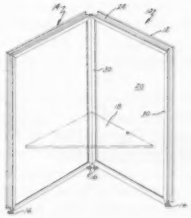
joining said assembly to said deep submersible vehicle to cover an opening therein such that the spatial relationships of the components during curing is preserved, thereby providing a panoramic viewing port therein to withstand operational conditions imposed by deep-sea deployment.

3,929,534

METHOD OF MAKING A UNITARY PARTITION BY FUSING A CONNECTOR PLATE PANELS

Charles Kay, 6425 Thornapple River Drive, SE., Alto, Mich. 49302

Filed Apr. 17, 1974, Ser. No. 461,485
Int. Cl.² B32B *31/20*
U.S. Cl. 156—73.5 **8 Claims**



1. A method of locking the flanged edge of a connector plate to a selected portion of a panel comprising the steps of providing a heat-fusible bonding agent to at least one of (a) the flanged edge of the connector plate and (b) the interior of said panel selected portion; driving the flanged edge of the plate into the selected portion of the panel, with sufficient force and velocity to generate frictional heat adequate to momentarily fuse the bonding agent between the flanged edge and the selected portion; and retaining the panel and plate in fixed relationship until the bonding agent cools and locks the edge of the plate to the panel.

3,929,535
COLOR REVERSIBLE, MIRROR SURFACE GLASSY MATERIALS FROM PLUMBITE-TREATED CELLULOSICS

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,693
Int. Cl.² B29C *25/00;* **B32B** *31/12;* **B44D** *5/00*
U.S. Cl. 156—82 **3 Claims**

1. A process for imparting to silica glass or ceramics reversible surface colorations which are visable from the one side in a mirror-like finish, when viewed from the same side as the light source, and are semi-transparent or clear when viewed from the opposite side, the said process comprising:

a. contacting a plumbite-treated cellulosic sheet flatly against a silica glass or ceramic surface, the said cellulosic sheet containing about from 8% to 15% lead,

b. heating the contacted material in a closed oven, or other limited oxygen environment, at a temperature of below 200°C. and elevating said temperature to about from 600° to 800°C. and maintaining the elevated temperature for a period of about 60 minutes to obtain a chemically bound unit of assembled components with hard surfaces,

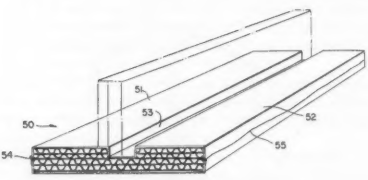
c. cooling the said unit slowly to avoid fractionation of the component parts, and

d. reheating the plumbite-treated side of the said unit with a gas-air flame of about from 1,000° to 1,500°C. to obtain colorations in the gold, silver, and purple range upon heating for periods of about from 1 to 5 minutes, the lesser quantities of heat yielding the golden tones, the medium quantities the silver tones, and the higher quantities the purplish tones.

3,929,536
MOISTURE RESISTANT CORNER POST

William G. Maughan, Nutley, N.J., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 252,048, May 10, 1972. This application Apr. 18, 1974, Ser. No. 461,922
Int. Cl.² B24C *27/26;* **B29C** *27/18*
U.S. Cl. 156—85 **2 Claims**



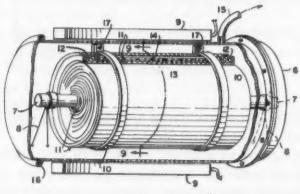
1. A method of manufacturing moisture resistant corner posts constructed from corrugated paperboard or the like which are protected from moisture penetration and contact with water vapor to thereby permit the corner posts to retain a high percentage of their dry strength when exposed to high humidity conditions comprising the steps of:

1. applying a top sheet of heat shrinkable plastic film of a width that is greater than the width of said corner posts to the upper face of said corner posts;
2. vacuum sealing said top sheet to the upper face of said corner posts;
3. applying a layer of adhesive to the bottom of said corner posts;
4. applying a bottom sheet of heat shrinkable plastic film of a width that is greater than the width of said corner posts to the lower face of said corner posts;
5. simultaneously adhering the top and bottom sheets of plastic film longitudinally to one another at each side of said corner posts;
6. adhering the top and bottom sheets of plastic film transversely to one another at each end of said corner posts; and,
7. collecting the completely film enclosed corner posts sealed on all sides.

3,929,537
PREPARATION OF PLASTIC-METAL LAMINATES

Ransome W. Erwin, Houston, Tex., assignor to Austral-Erwin Engineering Co., Houston, Tex.

Division of Ser. No. 371,346, June 19, 1973, abandoned, which is a division of Ser. No. 246,220, April 21, 1972, Pat. No. 3,837,956, which is a division of Ser. No. 41,375, May 28, 1970, abandoned, which is a division of Ser. No. 311,137, Dec. 1, 1972. Pat. No. 3,841,937. This application Mar. 26, 1974, Ser. No. 454,928
Int. Cl.² B32B *15/08*
U.S. Cl. 156—86 **4 Claims**



1. In a method of heat bonding a preformed, pliable continuous plastic film comprising a fluorocarbon polymer to a metal surface without employment of applied compressive pressure to said film or use of bonding additives; wherein the said film is first superimposed upon the metal surface of a thin flexible metal sheet in atmospheric environment over a substantial bonding area, and then the unbonded combination is subjected to partial or near total vacuum, and, next brought to the softening and bonding temperature of the plastic, the plastic film having no confining contact on its surface at any time during heating and bonding within the bonding area and entrapped air between the plastic film and the metal surface being liberated by the vacuum upon primary expansion of the plastic as its temperature is raised, thereby providing air free bonding when said film shrinks and bonds as the temperature is elevated, the improvement wherein, prior to subjecting to vacuum and heating, the superimposed layer of metal sheet and preformed pliable plastic film are wrapped in coils around a shaft or core, with superimposed spacer means at each end of the coil to provide an expansion space for a layer of film between each coil, bound with securing means to prevent uncoiling, and then subjected to vacuum and heating, to bond plastic film to the metal sheet within the bonding area, intermediate said space means and said securing means.

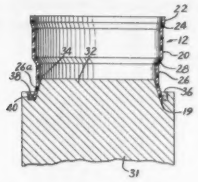
3,929,538
METHOD OF ASSEMBLING A THERMOPLASTIC SLEEVE ONTO A PIPE OR THE LIKE

Leverne G. Diebel, Cuyahoga Falls, Ohio, assignor to Clow Corporation, Oak Brook, Ill.

Filed June 14, 1974, Ser. No. 479,743
Int. Cl.² B29D *23/01*
U.S. Cl. 156—86 **6 Claims**

1. A method for assembling a thermoplastic tubular sleeve over the end of a pipe or the like, said pipe having an adhesive material disposed on the end thereof received within said sleeve, and said sleeve having an outermost end and an inner peripheral configuration which would normally cause the adhesive material to be wiped along the surface of said pipe forwardly of said outermost end of the sleeve as it is assembled coaxially over the end of the pipe, said method comprising the steps of heating at least the end portion of said sleeve to be

received over the end of said pipe to a temperature rendering said heated portion of said sleeve thermoplastic, deforming the outermost end and a first predetermined axial length of said heated end of said sleeve to a configuration having an inner surface circumference greater than the outer surface circumference of said end of said pipe so that said deformed end of said sleeve may be received over said end of said pipe and said adhesive material disposed thereon without wiping said adhesive along said end of said pipe, reducing the temperature of said outermost end and a contiguous second predetermined axial length of said heated end of said sleeve to a temperature below said thermoplastic temperature to maintain said deformed configuration of said first predetermined length of said sleeve, assembling said deformed end of said sleeve coaxially onto said end of said pipe member so that at least said outermost end and a portion of said deformed length of said sleeve is received over said adhesive material disposed on said pipe, and causing said deformed end of said sleeve to return to a substantially non-deformed configuration to compress said adhesive material between the inner peripheral surface of said sleeve and the outer peripheral surface of said end of said pipe.



3,929,539

ELASTOMERS ASSOCIATED WITH CORDS OF RADIAL TIRES AT POINTS CLOSE TO AND REMOVED FROM BEADS

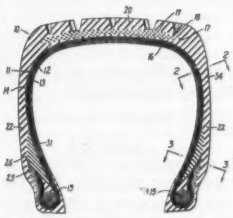
Jean Bernard Montagne, Cebazat, France, assignor to Compagnie Generale des Establissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Continuation of Ser. No. 285,083, Aug. 30, 1972, abandoned, which is a division of Ser. No. 99,371, Dec. 18, 1970, Pat. No. 3,709,277. This application June 21, 1974, Ser. No. 481,903

Claims priority, application France, Dec. 23, 1969, 69.44776

Int. Cl.[2] B29H *17/02*

U.S. Cl. 156—123 **2 Claims**



1. A method of manufacturing a radial pneumatic tire comprising the steps of forming a layer of green rubber stock convertible by vulcanization into a relatively low-modulus rubber, forming a ply of heat-shrinkable cords, calendering said cords with green rubber stock convertible by vulcanization into a relatively high-modulus rubber, providing a pair of bead rings, mounting said ply of calendered cords on said layer of rubber in tire-carcass form with said cords oriented radially and anchored on said bead rings to define two spaced-apart bead regions and, intermediate therebetween, a tread region, and heating said tire to effect vulcanization thereof and to cause said cords to shrink so that said cords and said rubber in which they are calendered penetrate into said layer of rubber adjacent to said tread region, whereby a tire is produced in which said relatively high-modulus rubber calenders said cords adjacent to said tread region, said relatively low-modulus rubber spaces said cords apart from one another adjacent to said tread region, and said relatively high-modulus rubber calenders said cords and spaces said cords apart from one another adjacent to said bead regions.

3,929,540

METHOD AND DRUM FOR BUILDING AND SHAPING BLANKS FOR RADIAL-PLY TIRES

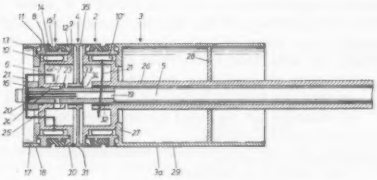
Gerhard Held, Hochstadt, and Walter Balle, Dornigheim-Waldsiedlung, both of Germany, assignors to Rheinstahl Aktiengesellschaft, Essen, Germany

Continuation-in-part of Ser. No. 271,125, July 12, 1972, Pat. No. 3,862,871. This application Dec. 19, 1974, Ser. No. 534,176

Claims priority, application Germany, July 13, 1971, 2134904

Int. Cl.[2] B29H *17/14, 17/16, 17/22, 17/26*

U.S. Cl. 156—123 **3 Claims**



1. A method for building and shaping a tire carcass on a tire building drum having two radially expandable bead holders movable relative to one another, an extension drum on at least one bead holder, and means for feeding compressed gas into a chamber located between the bead holders, comprising the method steps:

A. bringing closely together the bead holders and thereby forming a substantially continuous cylindrical surface;

B. laying a tire band on said cylindrical surface with one axial end of the tire band spaced axially beyond said one bead holder by a distance *a* equal to the length of the axial end portion of the tire band to be folded around a bead ring;

C. locating a bead ring around the tire band at said distance from said one axial end of said tire band and axially fixing the tire band to said one bead holder by expanding said one bead holder and thereby clamping said tire band against said bead ring;

D. axially moving apart said bead holders and thereby correspondingly spacing the other bead holder from the remaining free axial end of the tire band;

E. locating a further bead ring around the tire band in radial opposition to said other bead holder and expanding said other bead holder and thereby clamping said tire band against said further bead ring;

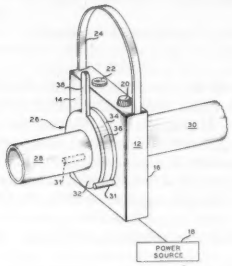
F. introducing a compressed gas into the chamber formed by the two bead holders and the tire band while simultaneously reducing the axial separation between said bead holders and thereby forming the substantially cylindrical tire band into a substantially toroidal shape.

3,929,541

METHOD FOR HEATING THERMOPLASTIC ELEMENTS

Johnnie E. Spears, Titusville, Pa., and Donald L. Caldwell, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 29, 1974, Ser. No. 464,955
Int. Cl.² B29C 27/06
U.S. Cl. 156—157 6 Claims



1. A method for heating an end of a first thermoplastic element to a first fusion temperature and a second thermoplastic element to a second fusion temperature, wherein the fusion temperature of said first element is lower than the fusion temperature of the second element and wherein the fusion temperature of both elements is reached at approximately the same time, comprising the steps of:

positioning an insulating surface adjacent a first heating surface of a heating means which has two heating surfaces to establish an insulated heating surface and a noninsulated heating surface;

pressing the insulated heating surface against the end of the first element to be heated;

pressing the noninsulated heating surface against the end of the second element to be heated;

heating the end of the second element for a period of time X;

thereafter removing the insulating surface from the first surface of the heating means;

pressing the noninsulated first surface against the end of the first element and the noninsulated second surface against the end of the second element for a period of time Y;

removing the noninsulated surfaces of the heating means from the ends of the elements; and

pressing the heated ends of the elements together while said ends are at or above their respective fusion temperatures and while said ends are properly aligned.

3,929,542

NON-WOVEN WEBS OF FILAMENTS OF SYNTHETIC HIGH MOLECULAR WEIGHT POLYMERS AND PROCESS FOR THE MANUFACTURE THEREOF

Heinz Gehrig, Buerstadt; Hermann Linge, Carlsberg, and Sepp Wagner, Weinheim, all of Germany, assignors to BASF Farben and Fasern A.G., Ludwigshafen (Rhine), Germany

Filed Nov. 3, 1971, Ser. No. 195,427
Claims priority, application Germany, Nov. 3, 1970, 2053918
Int. Cl.² D04H 3/16
U.S. Cl. 156—167 4 Claims

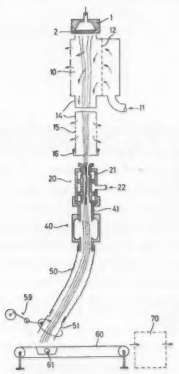
1. A process for the manufacture of a non-woven web of spun filaments, consisting of filaments or strands of filaments of synthetic high molecular weight polymeric material, by extrusion of filament-forming melts through spinnerets having a plurality of spinning holes arranged in circles, ellipses or lines, wherein:

a. cooling air is caused to impinge on the extruded filaments from one side at an angle of from 0° to 90° to the direction of travel of the filaments, all or at least part of which air is deflected to a direction of flow parallel to the filaments, by which means the filaments are asymmetrically cooled and a primary take-up of the filaments is effected;

b. at the end of the cooling zone substantially all of the cooling air is allowed to escape from or is sucked away from the filaments;

c. the filaments, substantially free from cooling air, are subjected to the main take-up forces in a take-up zone which is immediately downstream of the cooling zone and is in the form of a single-stage or, preferably, multi-stage pneumatic jet;

d. the filaments being thereby stretched by the action of said primary and main take-up forces upon them;



e. after stretching, the partially plastic filaments are helically crimped by periodic alteration of the position of one or more annular or cylindrical vortices of gaseous medium along the filaments at a high frequency with partial flow-off and replenishment of the vortex or vortices in conjunction with said asymmetrical cooling of the filaments whereby the diameter of the helices is from 1 to 10 mm and a change in direction of turn occurs after every 1 to 50 times;

f. the crimped filaments are discharged through flexibly mounted mouthpieces, which describe a transverse motion with superimposed rotating motion, onto a moving belt preferably provided with suction means at the point at which the said filaments initially contact the belt; and

g. the laid-down web is bonded.

3,929,543

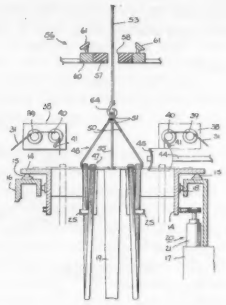
HANK FORMING MACHINE FOR A POLE CONSTRUCTION AND METHOD OF FORMING A POLE

Arthur Leslie Scott, Columbia; J. Hilton Parsons, Jr., and John S. Hammond, both of Newberry, all of S.C., assignors to Shakespeare Company, Columbia, S.C.

Division of Ser. No. 200,874, Nov. 22, 1971, Pat. No. 3,787,268. This application Sept. 6, 1973, Ser. No. 394,867
Int. Cl.² B65H 81/06
U.S. Cl. 156—169 13 Claims

1. In a method of forming an elongated pole the steps of forming a roving of resin impregnated filamentary material into a plurality of depending drapes over and between radially extending spokes of a circular rotatable member, thereafter bringing the draped roving together and lifting the material through a deformable orifice for pressing the

filamentary material together; and
subsequently wrapping the pressed material together for

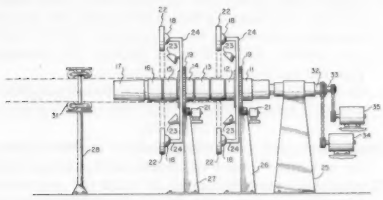


subsequent hardening into a self-supporting pole structure.

3,929,544
METHOD OF PRODUCING CONTINUOUS LENGTHS OF REINFORCED PLASTIC PIPE

Joseph Medrano, Jr., 14804 Daley Lane, Woodbridge, Va. 22191

Division of Ser. No. 290,601, Sept. 20, 1972, Pat. No. 3,837,970. This application June 14, 1974, Ser. No. 479,402
Int. Cl.² B31C *13/00*
U.S. Cl. 156—189 **1 Claim**



1. A method of production of built-up fiber reinforced plastic tubing on an elongated mandrel having a determined axis, where the tubing wall is built-up by layering and curing tape material of a variety having a cohesive characteristic, and the built-up tubing automatically moves off one selected end of the mandrel wherein:

the tape material is spirally wound, under selected tension, on a first variable circumference portion of said mandrel as said first portion of said mandrel continuously oscillates between an expanded first operational state and a relatively short term contracted second operational state, and said first portion periodically moves back and forth a selected axial distance as said first portion moves through each expansion-contraction cycle of operation;

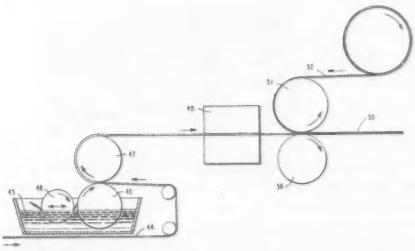
the oscillation and axial movement of said first portion is synchronized such that said first portion is in said first operational state during the time period said first portion moves along its axis toward said selected end; and

the axial movement of said built-up tubing is restrained as said first portion of said mandrel moves in the reverse direction along the axis of said mandrel; said built-up tubing being restrained by a second variable circumference portion of said mandrel located adjacent said selected end, said second portion being expanded when said first portion is in said second operational state so as to produce a high friction resistant contact between said second portion and the internal surface of said built-up tubing.

3,929,545
PRESSURE LAMINATING METHOD

Emil J. Van Dyck; Jerry L. Malina, and Raymond E. Schiller, all of Temple, Tex., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 268,259, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 170,076, Aug. 9, 1971, abandoned. This application May 23, 1974, Ser. No. 472,567
Int. Cl.² B32B *31/12, 31/20*
U.S. Cl. 156—220 **8 Claims**



1. A method of making a laminated product comprising the steps of:

a. impregnating a decorative sheet with a liquid thermosetting resin;
b. drying said resin on said decorative sheet;
c. coating said impregnated sheet on one side with a fluid radiation-curable resinous material consisting of 100 percent reactive solids;
d. radiating said resinous material until it attains a dimensionally stable semisolid state;
e. impressing a removable sheet upon said semisolid material with at least one pressure roller at about 5 to 150 pounds per linear inch;
f. placing the side of said impregnated sheet opposite said semisolid material into contact with a substrate;
g. applying heat and pressure to said impregnated sheet, removable sheet, semisolid material and substrate to cure said resin and semisolid material and bond said decorative sheet to said substrate; and,
h. removing said removable sheet.

3,929,546
COLLAPSIBLE TIRE BUILDING DRUM

Yoshiaki Katagiri, Kodaira; Takao Urayama, Higashimurayama, and Masaji Mori, Kurume, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo and Mori Ironworks Company Limited, Kurume, both of, Japan

Filed Dec. 4, 1973, Ser. No. 421,632
Claims priority, application Japan, Dec. 7, 1972, 47-122829
Int. Cl.² B29H *17/16*
U.S. Cl. 156—417 **5 Claims**

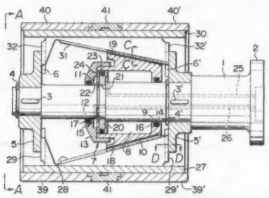
1. A collapsible tire building drum for manufacturing a carcass structure for a green tire, which comprises:

a rotary shaft for rotating said building drum;

a pair of flange members made of light metal and fixedly mounted on said rotary shaft in facing and spaced relationship with each other, each of said flange members having a plurality of radially extending guide grooves on its side surface facing the opposite flange member, each of said flange members having at least one pair of radially extending small grooves respectively formed on the inner side walls of each of said guide grooves;

a conical cam member made of said light metal and slidably mounted on said rotary shaft between said pair of flange members, said conical cam member having on its peripheral wall a plurality of axially extending and steeply tapered grooves and a plurality of axially extending and gently tapered grooves each of which is interposed between the adjacent two of said steeply tapered grooves, said conical cam member having a plurality of pairs of axially extending small grooves at least one pair of which are respectively formed on the side walls of each of said steeply tapered grooves and gently tapered grooves;

a first group of segments made of said light metal, each of said first group of segments having on its both side walls at least one pair of radially extending side projections to be respectively slidably engaged with said guide grooves



of said flange members, each of said projection having at least one pair of radially extending small grooves respectively formed on its side walls, said small grooves of said first group of segments respectively facing alternate ones of said small grooves of said flange members so as to define first guide rod bores, each of said first group of segments having on its radially inner wall an axially extending and steeply tapered inner projection slidably engaged with one of said steeply tapered grooves of said conical cam member, said inner projection having at least one pair of axially extending small grooves respectively formed on its side walls, each of said at least one pair of small grooves facing each of said at least one pair of small grooves of each steeply tapered groove so as to define a pair of second guide rod bores;

a second group of segment made of said light metal and interposed between the adjacent two of said first group of segments, each of said second group of segments having on its both side walls at least one pair of radially extending side projections to be respectively slidably engaged with said guide grooves of said flange members, each of said projections having at least one pair of radially extending small grooves respectively formed on its side walls, said small grooves of said second group of segments respectively facing the remaining small grooves of said flange members so as to define third guide rod bores, each of said second group of segments having on its radially inner wall an axially extending and gently tapered inner projection slidably engaged with one of said gently tapered grooves of said conical cam member, said inner projection of each of said second group of segments having at least one pair of axially extending small grooves respectively formed on its side walls, each of said at least one pair of small grooves facing each of said at least one pair of small grooves of each gently tapered groove so as to define a pair of fourth guide rod bores;

a plurality of guide rods respectively slidably accommodated in said first, second, third and fourth guide rod bores to provide respective small gaps between said projections and said grooves, each of said guide rods having a circular cross-section and being made of synthetic resin; and

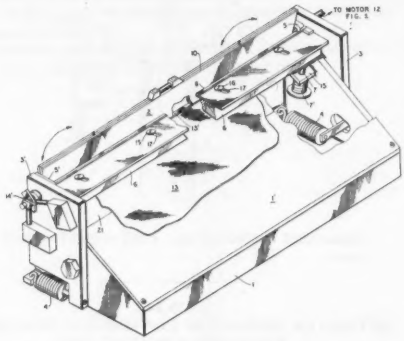
a conical cam member sliding means for sliding said conical cam member toward and away from alternate one of said flange members along said rotary shaft to collapse and expand said tire building drum.

3,929,547

APPARATUS FOR FOLDING AND PRESSING AN EDGE OF PLIANT MATERIAL

Danilo Paccagnella, Via Oltrebrenta, 6, Noventa Padova, Italy

Filed July 20, 1973, Ser. No. 381,227
Claims priority, application Italy, Dec. 7, 1972, 41711/72
Int. Cl.[2] B29C *17/00*
U.S. Cl. 156—443 **9 Claims**



1. Apparatus for folding and pressing an edge of a soft pliable material, comprising:

a supporting surface to receive and support a material to be folded;

movable material clamping means mounted in laterally spaced apart relation to an extremity of said supporting surface, said clamping means being mounted for selective movement between a raised position relative to said support surface and a lowered position for clamping the material against said support surface;

a material folding blade carried by said clamping means and having a folding edge parallel with said supporting surface;

means mounting said folding blade on said clamping means for a limited extent of movement transversely of said clamping means between an extended position and a retracted position, said folding blade when in said extended position placing said folding edge adjacent said supporting surface extremity in fold line defining relation with the material clamped by said clamping means;

a folding body mounted for selective rotation about an axis which is substantially parallel with said supporting surface extremity, said folding body having a folding surface which forms an extension of said support surface beyond said extremity when said folding body is rotated to an initial rotational position;

means operative to rotate said folding body about said axis from said initial rotational position to a terminal rotational position placing said folding surface in substantially parallel and confronting relation with said supporting surface between said extremity and said clamping means, so that an edge portion of the material which was clamped on said folding surface is folded back onto and pressed against said clamped material;

cam means mounted for rotation concurrently with said selective rotation of said folding body;

cam engaging means operatively associated with said clamping means to be engaged by said cam means for moving said clamping means to said raised position when said folding body is in said initial rotational position; and means operatively associated with said clamping means to lower said clamping means.

6. Apparatus for folding and pressing an edge of a soft pliable material, comprising:

a supporting surface to receive and support a material to be folded;

movable material clamping means mounted in laterally spaced apart relation to an extremity of said supporting surface, said clamping means being mounted for selective movement between a raised position relative to said support surface and a lowered position for clamping the material against said support surface;

a material folding blade carried by said clamping means and having a folding edge parallel with said supporting surface;

means mounting said folding blade on said clamping means for a limited extent of movement transversely of said clamping means between an extended position and a retracted position, said folding blade when in said extended position placing said folding edge adjacent said supporting surface extremity in fold line defining relation with the material clamped by said clamping means;

a folding body mounted for selective rotation about an axis which is substantially parallel with said supporting surface extremity, said folding body having a folding surface which forms an extension of said support surface beyond said extremity when said folding body is rotated to an initial rotational position;

means operative to rotate said folding body about said axis from said initial rotational position to a terminal rotational position placing said folding surface in substantially parallel and confronting relation with said supporting surface between said extremity and said clamping means, so that an edge portion of the material which was clamped on said folding surface is folded back onto and pressed against said clamped material; and

resilient means supporting said axis of said folding body to allow said axis and said folding body to undergo a limited extent of translational movement relative to said supporting surface as said folding body is rotated to assume said terminal position.

3,929,548

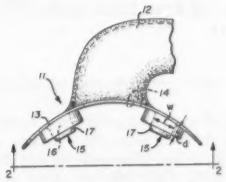
METHOD FOR CUSTOMIZING MOUTHPIECE RETAINER FOR UNDERWATER BREATHING APPARATUS

Ralph B. Shamlian, San Francisco, Calif., assignor to Farallon Industries, Inc., Belmont, Calif.

Division of Ser. No. 402,720, Oct. 2, 1973, Pat. No. 3,844,281. This application Aug. 21, 1974, Ser. No. 499,183

Int. Cl.² A61D *15/00;* **B29B** *3/00*

U.S. Cl. 156—245 **6 Claims**



1. The method of customizing the retaining portion of a mouthpiece of an underwater breathing apparatus to the bite of the individual user comprising the steps of:

heating a blank of thermoplastic material as an individual portion of the retaining portion of the mouthpiece to a temperature sufficient to render the blank thermoplastic; placing the mouthpiece in the mouth of the user while at an elevated temperature compatible with use within the mouth of the user and while in a thermoplastic state;

biting down on the blank thermoplastic material while in the thermoplastic state to squeeze and compress the blank so as to cause the blank to flow and to form an impression of the users bite in the thermoplastic blank and allowing the impressed blank to cool, whereby the retainer portion of the mouthpiece is customized to the bite of the user.

3,929,549

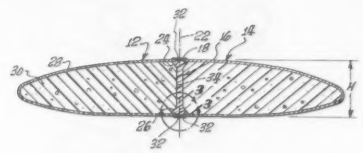
SURFBOARD CONSTRUCTION

Robert L. Smith, 435 Fair Drive, Apt. No. 103, Costa Mesa, Calif. 92626

Division of Ser. No. 316,058, Dec. 18, 1972, Pat. No. 3,802,010. This application Dec. 14, 1973, Ser. No. 424,727

Int. Cl.² A63C *15/02;* **B29C** *5/02*

U.S. Cl. 156—245 **3 Claims**



1. A method for constructing a surfboard comprising:

laying cover layers in each of two molds that each have substantially the shape of opposite halves of a surfboard that is divided by an imaginary vertical plane passing longitudinally through the middle of a horizontal surfboard, and that each have a cavity with a depth at least twice as great as the thickness at a middle portion thereof, including applying a thin layer of wax-like material to the mold, spraying a gel coat within the wax-like material, applying flexible fiberglass sheet material saturated with resin within the gel coat, and squeegeeing excess resin from within the fiberglass sheet material;

filling each mold with a moldable material to form two elongated surfboard portions, each with an inner surface that can lie substantially along said imaginary plane, including pouring foamable material into the shell formed by said cover layer and allowing it to harden;

forming an elongated cutout region in the molding material along the top and bottom of each elongated surfboard portion at the inner surface thereof to expose an area of the inner face of the cover layer;

filling the cutout regions with an epoxy resin adhesive and allowing it to harden at least partially; and

applying a layer of epoxy resin adhesive of a putty-like consistency and of a thickness of more than one-sixteenth inch to the inner surface of the body and to the epoxy adhesive in said cutout regions.

3,929,550

PROCESS FOR PROMOTING POLYOLEFIN ADHESION

Norman G. Gaylord, New Providence, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 27, 1973, Ser. No. 392,134

Int. Cl.² C09J *5/00*

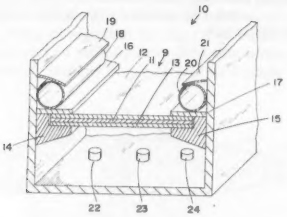
U.S. Cl. 156—306 **6 Claims**

1. A process for forming a tightly adherent layer of solid olefinic polymer on the surface of a solid substrate which comprises admixing as the entire resinous ingredient previously unmodified, normally solid synthetic resin derived entirely from alpha mono-olefinically unsaturated hydrocarbons containing from two to four carbon atoms with between about 0.5 and about 5% based upon the weight of said resin of t-butyl betahydroxyethyl peroxide, applying the resulting mixture directly to the surface of said solid substrate and then pressing said mixture against said substrate by the application of pressure of at least about 20,000 psi and elevated temperatures in the range from about 122° to about 190°C until the major portion of said t-butylbetahydroxyethyl peroxide has been decomposed.

3,929,551
SEALING APPARATUS FOR CONTINUOUS MOVING WEB

John J. Frantzen, North St. Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed July 11, 1974, Ser. No. 487,662
Int. Cl.² C23F 1/02
U.S. Cl. 156—345 5 Claims



1. An apparatus for isolating one face of a continuous web from attack by etchant while allowing the opposite face of the web to be attacked by an etchant as the web passes through an etching chamber, comprising:

an etching chamber for directing etchant at one face of a web;

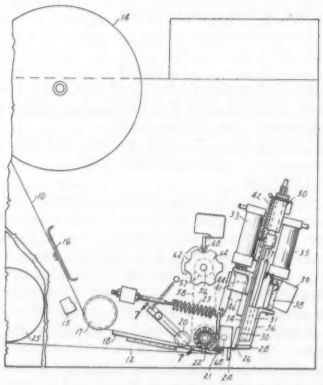
means located in said etching chamber for supporting the opposite edges of said web including a first pair of sealing members for contacting the edges on one face of said web; and

flexible sealing means for coacting with said first pair of sealing members for sealing the edges of said web between said first pair of sealing members and said flexible sealing means to thereby provide a barrier to etchant leaking past the edges of the web.

3,929,552
TAPE APPLICATING APPARATUS

Larry A. Bettenhausen, West Lakeland Township, Washington County; James H. Casey, Roseville, both of Minn., and Robert A. Luhman, Cylon Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 28, 1974, Ser. No. 436,874
Int. Cl.² B65H 35/06
U.S. Cl. 156—391 8 Claims



8. An apparatus for severing and applying short lengths of tape comprising a backing having a pressure-sensitive adhesive coating on one surface thereof, a liner wider than said backing, said liner surfacing said adhesive with the edges of said liner extending beyond said backing and said backing having a lofty fibrous surface opposite said adhesive coated surface, to a product including:

a housing;

a platen for supporting said tape and liner, said platen having a width equal to the width of said backing;

a guide roller engageable with said fibrous surface to hold said tape and liner on said platen, said roller having radially extending flanges to engage and bend the outward extending edges of said liner along the edges of said platen to guide said tape and liner along said platen;

means for dispensing tape from an end of said platen in predetermined measured lengths comprising a driven roller which engages the lofty surface of said tape to move said tape and liner along said platen, and means at said end of said platen for peeling said liner from said tape;

cutting means for severing the dispensed lengths of tape; and

an applicating means mounted on said housing to receive the severed lengths of tape comprising:

a reciprocating pad located on the side of the cutting means opposite said dispensing means having a surface suitable for pressing a severed length of tape against the product;

a bifurcated plate slidably supported on said pad and defining a pair of fingers positioned one on each side of said pad and movable in relation to said pad to hold a severed portion of said tape firmly against an applicating surface of said pad and adapted to move with said pad, said fingers extending toward each other over said surface;

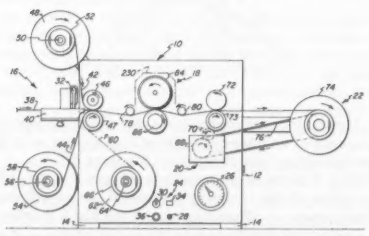
means for retracting said fingers and said reciprocating pad from said product;

a push rod supported for reciprocating movement parallel to and independent of said pad and in position for movement between said fingers to a holding position whereby when said pad has applied said severed length of tape to said product, said rod can hold said severed material against said product while said pad and fingers are retracted insuring the severed material remains in contact with said substrate when the fingers are retracted.

3,929,553
FILM SLEEVING APPARATUS

Charles van Kempen, Haworth, N.J., assignor to Simplex Specialty Co., Inc., Hackensack, N.J.

Filed Sept. 13, 1974, Ser. No. 505,866
Int. Cl.² B29C 27/02; B30B 15/34
U.S. Cl. 156—391 7 Claims



1. Apparatus for sleeving a web of photographic film within a sleeve of foil, the web of film having a given width between opposite side edges thereof and being selected from a plurality of webs of film of different fixed given widths, said apparatus comprising:

supplying means for supplying webs of foil along a predetermined path of travel;

feed means for feeding the web of film to be sleeved into said predetermined path of travel and between the webs of foil, said feed means including guide means for accommodating film webs of any one of said different fixed given widths;

drive means for transporting the webs of foil, with the web of film therebetween, along said predetermined path of travel; and

heat-sealing means for fusing the webs of foil at the side edges of the web of film, as the foil and the film move along said predetermined path of travel, to form a sleeve surrounding the web of film, said heat-sealing means comprising:

a heater roller;

means mounting said heater roller for rotation;

first and second heat rings disposed on the heater roller for engaging the foil webs at the side edges of the film web;

means for heating the heat rings so as to seal the engaged foil;

at least two annular grooves located in the circumference of the heater roller, said grooves being spaced from the first heat ring at different fixed distances corresponding to the different fixed given widths of said plurality of webs of film;

said second heat ring being selectively positionable in one of said annular grooves to match the fixed distance between the first and second heat rings to the given width of the selected web of film.

3,929,554

DEVICE FOR MANUFACTURING FIBRE REINFORCED PLASTIC TUBES

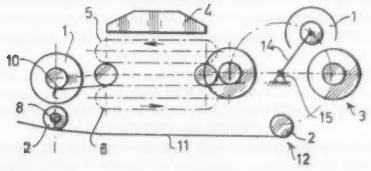
Willem Kiezebrink, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed June 14, 1973, Ser. No. 369,844

Claims priority, application Netherlands, June 14, 1972, 7208096

Int. Cl.² B31C *1/02*, *1/08*

U.S. Cl. 156—425 **4 Claims**



1. An apparatus for manufacturing fiber reinforced pipes, comprising:

a core on which reinforcing fibers can be wound, said core having a pair of shafts, one shaft extending outwardly from each side of said core, and a pair of gear wheels having gear teeth, one gear wheel being fixedly mounted on each of said shafts;

a heater for heating said core with the fibers and resins applied thereto;

a conveyor extending through said heater and comprising a movable upper chain having links and a movable lower chain having links, said chains being spaced apart and being substantially parallel, means for driving said chains in opposite directions relative to one another and at different speeds, said gear wheel teeth engaging said links of said chains whereby said core rotates while simultaneously being conveyed through said heater;

a core lifting device mounted for movement of said core from a supply station to a winding device provided for the apparatus, said lifting device also being mounted for subsequent movement of said core from said winding device toward said conveyor; and

a return means for returning said core after it has been conveyed through said heater, said return means further including means to control the rate of return of said core.

3,929,555

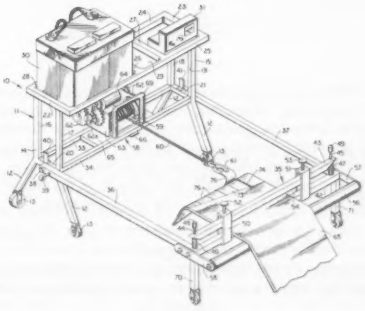
CONVEYOR BELT STRIPPER

Lloyd E. Sanders, 2680 Braithwood Road, NE., Atlanta, Ga. 30345

Filed Jan. 7, 1974, Ser. No. 431,050

Int. Cl.² B66D *1/00*

U.S. Cl. 156—584 **4 Claims**



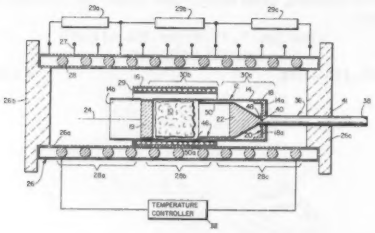
1. Apparatus for stripping a layer of material from a conveyor belt or the like comprising a framework including a winch track means for supporting a winch means and allowing a winch means to move along a rectilinear path, a pair of overlying rectilinear clamping bars positioned approximately parallel to the path of said winch track means and movable toward and away from each other and displaced from said winch track means for rigidly clamping the end portion of a flat belt of the like uniformly across its length with the length of the belt extending normal to the length of said winch track means, winch means including a reel and cable means mounted on said winch track means, said winch means being freely movable along the length of said winch track means for repositioning the free end of the cable with respect to said clamping bars and for movement into alignment with the length of the flat belt in the clamping bars, said cable means extending freely outwardly from said reel toward said clamping bars, and power means connected to said winch means for supplying power to said winch means, whereby a conveyor belt or the like which is to have a layer of material thereof stripped therefrom is clamped in the clamping bars with its end portion extending from the clamp member toward the winch track means and with its length extending normal to the winch track means, the winch means moved along the winch track means into alignment with the portion of the material of the conveyor belt which is to be stripped from the conveyor belt and the cable is connected to the portion of the material to be stripped from the conveyor belt, and the winch is operated to strip the portion of the material from the conveyor belt in a direction extending along the length of the conveyor belt.

3,929,556

NUCLEATING GROWTH OF LEAD-TIN-TELLURIDE SINGLE CRYSTAL WITH AN ORIENTED BARIUM FLUORIDE SUBSTRATE

Raghvendra K. Pandey, West Carrollton, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Feb. 19, 1974, Ser. No. 443,385
Int. Cl.[2] H01L 7/62
U.S. Cl. 156—611 25 Claims



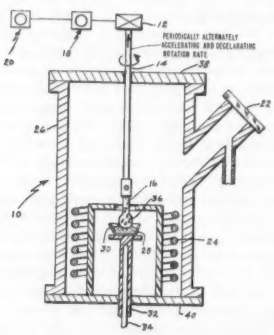
1. The method of producing a single crystal of lead-tin-telluride comprising depositing homogeneous lead-tin-telluride vapor on a crystallographically oriented barium fluoride substrate to form a growing bulk single crystal having the same orientation as the substrate and removing the single crystal from the substrate after sufficient growth of the single crystal has occurred for the crystal to be self-supporting.

3,929,557

PERIODICALLY AND ALTERNATELY ACCELERATING AND DECELERATING ROTATION RATE OF A FEED CRYSTAL

John W. Goodrum, Atlanta, Ga., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 11, 1973, Ser. No. 369,035
Int. Cl.[2] B01J 17/18
U.S. Cl. 156—617 5 Claims



1. In a system for growing single crystalline boules which comprises the steps of placing a seed crystal in contact with the surface of a molten solution of crystal growing material, lowering the temperature of the molten solution at a programmed rate to a temperature sufficient to effect the formation of a rod-like crystalline boule on said seed crystal while simultaneously rotating and withdrawing said seed crystal during said lowering of said temperature, and cooling said formed crystalline boules to room temperature, the improvement which comprises periodically altering the rotation rate of said rotating seed crystal by alternately accelerating and decelerating said rate of rotation at a constant rate for a predetermined period of time.

3,929,558

METHOD OF ADDING A SOLUBLE ALUMINUM SALT TO CHEMICALLY SOFTENED WOOD CHIPS FOLLOWED BY MECHANICAL REFINING

Alan C. Shaw, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold, Canada

Filed Mar. 11, 1974, Ser. No. 449,748
Int. Cl.[2] D21C 3/26
U.S. Cl. 162—28 8 Claims

1. In a process for producing wood pulp by the successive steps of treating wood chips with an aqueous solution of a soluble bisulphite salt to soften the bonds between the fibres in the chips and obtain softened chips and subjecting the softened chips to mechanical refining to cause separation of the fibres of the softened chips one from another to provide a wood pulp, the improvement which comprises treating said softened chips after said softening step and prior to said mechanical refining step with a soluble salt of aluminum which yields positive aluminum ions in solution to obtain increased fibre-to-fibre friction during said refining step and to result in increased stretch, fibre-flexibility and conformability of the fibres of the pulp while substantially avoiding fibre shortening, generation of fines and drop in freeness, said soluble salt being used in a quantity of at least 5 lbs. per ton of pulp and at a pH of about 3 to about 6.

3,929,559

STABILIZATION OF CELLULOSIC MATERIAL BY TREATMENT WITH FERRICYANIDE ION

Alan R. Procter, North Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Dec. 16, 1974, Ser. No. 533,027
Int. Cl.[2] D21C 1/00, 1/06
U.S. Cl. 162—70 13 Claims

1. A method for stabilizing a cellulosic material against degradation by an aqueous alkaline medium that comprises treating the cellulosic material with ferricyanide ion under alkaline conditions.

3,929,560

CONTINUOUS PROCESS FOR FORMING WEBS FROM FIBER SUSPENSIONS

Herbert Holik, Ravensburg, and Karl Mueller, Ringgenweiler, both of Germany, assignors to Escher Wyss G.m.b.H., Ravensburg, Germany

Continuation of Ser. No. 311,483, Dec. 4, 1972, abandoned. This application Jan. 17, 1974, Ser. No. 434,136
Claims priority, application Germany, Dec. 9, 1971, 2161101
Int. Cl.[2] D21F 11/00
U.S. Cl. 162—157 R 3 Claims

1. A continuous process for forming a web from long synthetic fibers comprising

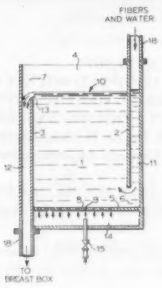
a. establishing in a tank a body of water in which the fibers are suspended;

b. subjecting said body of suspension to an upward directed field of gas jets to agitate the suspension and thereby prevent entaglement of the fibers and encourage uniform distribution of same in the water;

c. continuously feeding a mixture water and fibers into the tank at one side of the jet field, below the surface of said body of suspension, and in the form of a stream which has a rectangular cross section and spans the entire width of the tank;

d. continuously withdrawing suspension from the tank over

a weir located at the opposite side of the jet field and which spans the entire width of the tank; and



e. continuously conveying said withdrawn suspension directly to the breast box of a web-forming machine.

3,929,561

SYNERGISTIC COMPOSITIONS CONTAINING BIS (TRICHLOROMETHYL) SULFONE AND THEIR USE

Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 3, 1975, Ser. No. 554,367

Int. Cl.² D21D *3/00*; **D21H** *5/22*; **A01N** *9/12*, *9/20*

U.S. Cl. 162—161 **8 Claims**

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% 2-methyl-4-isothiazolin-3-one calcium chloride with Bis (trichloromethyl) sulfone wherein the weight ratio of the chloride mixture to the sulfone ranges from about 95:5 to about 5:95 respectively.

3,929,562

SYNERGISTIC COMPOSITIONS CONTAINING 2,2-DIBROMO-3-NITRILOPROPRIONAMIDE AND THEIR USE

Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 3, 1975, Ser. No. 554,368

Int. Cl.² D21D *3/00*; **D21H** *5/22*; **A01N** *9/12*, *9/20*

U.S. Cl. 162—161 **8 Claims**

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% 2-methyl-4-isothiazolin-3-one calcium chloride with 2,2-Dibromo-3-nitrilopropionamide wherein the weight ratio of the chloride mixture to the amide ranges from about 95:5 to about 5:95 respectively.

3,929,563

SYNERGISTIC COMPOSITIONS CONTAINING N (2 NITROBUTYL) MORPHOLINE AND THEIR USE

Bernard F. Shema, Glenside, and Robert H. Brink, Jr., Doylestown, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 3, 1975, Ser. No. 554,369

Int. Cl.² D21D *3/00*; **D21H** *5/22*; **A01N** *9/12*, *9/20*

U.S. Cl. 162—161 **8 Claims**

1. A composition for the control of the microorganism *Aerobacter aerogenes* in aqueous systems comprising a mixture of 75% of 5-chloro-2-methyl-4-isothiazolin-3-one calcium chloride and 25% 2-methyl-4-isothiazolin-3-one calcium chloride with N (2 nitrobutyl) morpholine wherein the weight ratio of the chloride mixture to the morpholine ranges from about 95:5 to about 5:95 respectively.

3,929,564

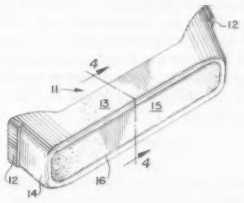
METHOD OF MOLDING FREE DRIED PULP DISPLAY TRAY

Richard F. Reifers, New Canaan, Conn., assignor to Diamond International Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 99,100, Dec. 17, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 353,065

Int. Cl.² D21J *3/00*

U.S. Cl. 162—224 **11 Claims**



1. The method of making a free-dried, molded pulp tray with a plurality walls of which at least one of said walls is to have a generally central flat area surrounded by an offset or indented peripheral margin including the steps of preliminarily forming wet pulp in the shape of a tray having a plurality of walls, forming a generally central flat area in at least one of said walls and an offset or indented peripheral margin around the generally central flat area of said at least one of said walls and then finally drying said freshly formed wet and undried tray formation in a free-drying step without restraint such as would occur in form drying.

3,929,565

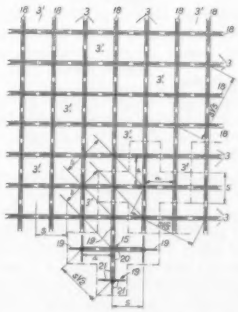
NUCLEAR REACTOR WITH GROUPS OF ELONGATED ABSORBER UNITS CARRIED BY CONTROL RODS

Bo Fredin, and Lars Leine, both of Vasteras, Sweden, assignors to AB Asea-Atom, Vasteras, Sweden

Continuation of Ser. No. 112,218, Feb. 3, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 445,314

Int. Cl. G21c *7/10*, *7/12*

U.S. Cl. 176—35 **26 Claims**



1. A nuclear reactor having a core including a plurality of fuel assemblies each containing a substantially equal quantity of nuclear fuel, a plurality of control rods having longitudinal axes substantially parallel with longitudinal axes of the fuel assemblies, a group of elongated absorber units carried by each of said control rods for displacement into and out of the

core, said group of absorber units and the absorber units in said group each having a center of gravity and a longitudinal axis substantially parallel with the longitudinal axes of the fuel assemblies, said group including a central absorber unit having its center of gravity substantially coincident with the center of gravity of the group and a plurality of outer absorber units having their centers of gravity substantially equally spaced from the center of gravity of the group and symmetrically arranged therearound, there being absorber units of at least two of said groups located within or immediately adjacent each fuel assembly, and at least some of the absorber units of one of said groups carried by one control rod being located within or immediately adjacent different fuel assemblies, and, where a is the distance between the longitudinal axis through the center of gravity of the group of absorber units mounted on one control rod and the longitudinal axis through the center of gravity of an outer absorber unit of the same group and b is the distance between the longitudinal axis of one control rod and the longitudinal axis of the nearest absorber unit of an adjacent control rod, there being a ratio between *a* and *b* such that (*a*/*b*) is at least 1/ 2.

3,929,566

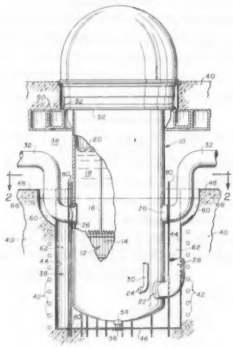
VOLUME DISPLACING MODULES FOR LIQUID METAL COOLED NUCLEAR REACTORS

Richard Croissant Noyes, Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 25, 1973, Ser. No. 373,049

Int. Cl. G21c *13/08*

U.S. Cl. 176—37 **9 Claims**



1. In combination;

a liquid metal cooled reactor vessel having a nuclear core therein, a plurality of nozzles mounted thereon and communicating with the interior thereof, a conduit means coupled with said nozzles for communicating liquid metal coolant into and out of said reactor vessel to cool said nuclear core, said vessel having a coolant containing plenum in the interior thereof, a portion of said plenum above a predetermined elevation above said nuclear core being of a first coolant containing volume;

a containment structure forming a vessel cavity in which said vessel is vertically disposed, said vessel being spaced from the walls of said containment structure to define a peripheral space the lateral dimension of which is sufficient to permit access by personnel into said space, and said peripheral space below said predetermined elevation defining a second volume; and

a plurality of volume displacing modules removably positioned in said peripheral space, the total volume of all of said modules positioned below said predetermined elevation being such that said second volume minus said total volume of all said modules is less than said first volume thereby insuring that level of coolant in said vessel will remain above said predetermined elevation in the event of coolant leakage into said cavity.

3,929,567

NUCLEAR REACTOR EQUIPPED WITH A FLOODING TANK AND A RESIDUAL HEAT REMOVAL AND EMERGENCY COOLING SYSTEM

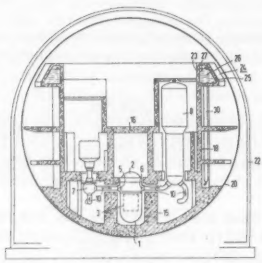
Hans-Peter Schabert, and Franz Winkler, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 9, 1973, Ser. No. 349,537

Claims priority, application Germany, Apr. 11, 1972, 2217398

Int. Cl. G21c *9/02*

U.S. Cl. 176—38 **28 Claims**



1. A nuclear reactor having a protective enclosure surrounding equipment comprising a reactor pressure vessel, a coolant circuit connected to said pressure vessel for conducting coolant through the same and exposed directly to the inside of said enclosure, a residual heat removal and emergency cooling system connected to said coolant circuit for providing cooling of the reactor core following a shut down of the reactor or a loss-of-coolant accident, and a flooding tank arranged in said protective enclosure at an elevation above the upper edge of said reactor core, said flooding tank being connected to said circuit and being configured to hold a quantity of liquid sufficient to flood said reactor core in the event of a loss of coolant.

3,929,568

NUCLEAR POWER PLANT CONTAINMENT CONSTRUCTION

Hans-Peter Schabert; Rüdiger Danisch, and Erich Strickroth, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 6, 1973, Ser. No. 394,755

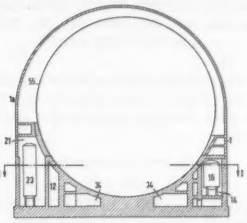
Claims priority, application Germany, Sept. 11, 1972, 2244563

Int. Cl. G21c *13/10*

U.S. Cl. 176—38 **7 Claims**

1. A nuclear reactor installation comprising a spherical steel enclosure, pressure-carrying components at least comprising a pressurized-coolant reactor pressure vessel having a pressurized-coolant pump and a pressurized-coolant heat-exchanger, said components being contained inside of said enclosure and the enclosure being air-tight and functioning to intercept pressurized-coolant accidentally released by any of said components, a concrete construction entirely enclosing said spherical steel enclosure and forming an upstanding cylindrical wall extending upwardly to at least the equator of the spherical steel enclosure and a top over the spherical steel enclosure, said upstanding cylindrical wall forming an annular space extending completely around said spherical steel enclo-

sure and which is accessible to personnel during operation of said components, the vertical axis of said cylindrical wall being horizontally offset from the vertical axis of said spheri-



cal steel enclosure to form an enlarged area in said space in the direction of said offset, and means for ventilating said space.

3,929,569

PLATE SPRING OR RETAINING GRID FOR A BUNCH CYLINDRICAL ELEMENTS ENGAGED IN A HEAT EXCHANGE PROCESS

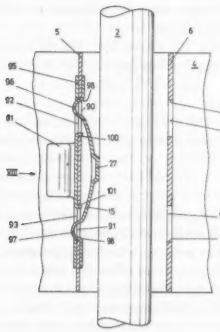
Gijsbrecht Gerhardus Piepers, Heiloo, and Leonard Hendrik Vons, Bergen, both of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Filed June 27, 1973, Ser. No. 374,065

Claims priority, application Germany, July 10, 1972, 2233904

Int. Cl. G21c *3/18, 3/34*

U.S. Cl. 176—78 **3 Claims**



1. A supporting grid for supporting a plurality of elements engaged in a heat exchange process against sideways shifting comprising: a plurality of grid strips connected together to form the sidewalls of a plurality of compartments having parallel axes; a plate spring extending longitudinally in each compartment, said plate spring having a continuous surface facing the sidewall of the respective compartment, said spring having a central arch-like bend projecting toward the center of the respective compartment for engaging an element therein and having at each end of the arch-like bend a smaller bend facing in the opposite direction, said spring further having straight end portions which engage the sidewall of the respective sidewall, each end portion extending longitudinally outwardly from the respective smaller bend so that the surface of the end portion engaging the sidewall is part of said continuous surface, each of said smaller bends projecting through an aperture in the adjacent sidewall and engaging only that edge of the respective aperture which is adjacent the straight end portions of the plate spring to thereby fasten said plate spring to said adjacent sidewall; and an element holder in each compartment engaging the sidewall opposite the respective plate spring and having a portion projecting toward the center of the compartment for engaging an element therein on the opposite side from the respective plate spring.

3,929,570

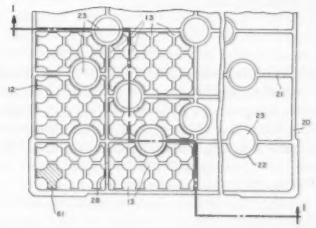
FAILED FUEL DETECTION FOR PWR

Cecil R. Jones, Orange, Conn.; Alfred H. Yoli, New City, N.Y., and William F. Kirk, Orange, Conn., assignors to Transfer Systems Incorporated, North Haven, Conn.

Filed Jan. 14, 1974, Ser. No. 432,902

Int. Cl. G21c *3/10*

U.S. Cl. 176—80 **8 Claims**



1. A fuel element for a nuclear reactor comprising a sealed pressurized containment, nuclear fuel within the containment, and means located within the containment and responsive to pressure changes therein for indicating a pressure change within the containment, said pressure-responsive means comprising a sealed flexible tube curved around a central axis of the fuel element and having a free end, means for anchoring the non-free end of the sealed tube, said sealed flexible tube being pressurized to a pressure different from that of the containment, said sealed tube being configured such that the free end rotates when the containment pressure changes, and a soft magnetic member connected to the free end of the sealed tube and rotatable therewith for indicating its radial position, said magnetic member having a shape and being connected to the free end such that it is non-symmetrical with respect to the central axis.

3,929,571

PROCESS FOR PREPARING L-LYSINE

Koji Kubota; Yasuhiko Yoshihara, both of Kawasaki, and Yoshio Hirose, Fujisawa, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,190

Claims priority, application Japan, May 24, 1973, 48-58361; June 2, 1973, 48-62258

Int. Cl.[2] **C12D** *13/06*

U.S. Cl. 195—29 **7 Claims**

1. In a process of producing L-lysine by aerobically culturing an L-lysine producing microorganism at pH 5 to 9 on a medium containing assimilable sources of carbon and nitrogen, inorganic salts and minor organic nutrients required for the growth of said microorganism until L-lysine accumulates in said medium, and by recovering the accumulated L-lysine, said microorganism being a strain of Brevibacterium, Corynebacterium, Microbacterium, Micrococcus, or Arthrobacter, the improvement which comprises culturing said microorganism in said medium in the presence of an amount of an addition agent sufficient to improve the yield of said L-lysine as compared to the yield of said L-lysine produced in the absence of said agent, said agent being an antibiotic, a surface active agent, or an anti-oxidant.

3,929,572
METHOD FOR THE PRODUCTION OF N-ACYLPENTAPEPTIDES
Noriaki Kuwana, Inuyama; Kouichi Suzuki, Ichinomiya, and Tooru Sugitani, Aichi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan
Filed Nov. 8, 1974, Ser. No. 522,268
Claims priority, application Japan, Nov. 15, 1973, 48-127716
Int. Cl.² C12D 13/06
U.S. Cl. 195—29 4 Claims

1. In the method for providing N-acylpentapeptides by cultivation of the Streptomyces naniwaensis EF44-201 (ATCC 21689) strain, the improvement wherein the culture is carried out in a nutrient medium containing a precursor of said N-acylpentapeptides selected from the group consisting of S-acetylglutathion, and 4-amino-3-hydroxy-6-methyl-heptanoic acid or derivatives thereof.

3,929,573
METHOD OF PREPARING L-TRYPTOPHAN
Sano: Konosuke, Machida, and Koji Mitsugi, Yokohama, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed Dec. 20, 1974, Ser. No. 534,640
Claims priority, application Japan, Dec. 29, 1973, 49-455
Int. Cl.² C12D 13/06
U.S. Cl. 195—29 5 Claims

1. A method for producing L-tryptophan or 5-hydroxy-L-tryptophan which comprises holding an aqueous mixture containing tryptophanase, indole or 5-hydroxyindole and β-halogenoalanine at 5° to 60°C until the indole or 5-hydroxyindole is converted to L-tryptophan or 5-hydroxy-L-tryptophan, and recovering the L-tryptophan or 5-hydroxy-L-tryptophan produced from the aqueous mixture.

3,929,574
USE OF ENZYMES BOUND TO POLYURETHANE
Louis L. Wood, Rockville; Frank J. Hartdegen, and Peter A. Hahn, both of Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.
Division of Ser. No. 362,488, May 21, 1973, which is a continuation-in-part of Ser. No. 404,823, Oct. 9, 1973, which is a continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application Mar. 21, 1975, Ser. No. 560,741
Int. Cl.² C12B 1/00
U.S. Cl. 195—29 6 Claims

1. The method of treating a material with an enzyme which includes the step of contacting an aqueous dispersion or solution of the material with a foamed polyurethane containing an enzyme integrally bound thereto prepared by the method which includes contacting, prior to a subsequent foaming step, an isocyanate-capped polyurethane with an aqueous dispersion of an enzyme, under foam-forming conditions, whereby the polyurethane foams and the enzyme becomes integrally bound to the thus formed polyurethane foam.

3,929,575
METHOD OF PRODUCING GLUTAMIC ACID BY FERMENTATION
Guido M. Miescher, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.
Filed Oct. 2, 1974, Ser. No. 504,943
Int. Cl.² C12D 13/06
U.S. Cl. 195—30 2 Claims

1. In a process for the production of glutamic acid by cultivating the glutamic-acid producing organism Brevibacterium divaricatum on a nutrient fermentation medium consisting of a carbon source, a nitrogen source, essential minerals and a growth factor, while maintaining the carbon dioxide concentration in the exhaust gas below 6.5% during the fermentation, the improvement consisting of using ammonium acetate in the medium at a concentration of 3–7 g per liter.

3,929,576
PRODUCING 3-FLUORO-D-ALANINE
Donald F. Reinhold, North Plainfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 223,355, Feb. 3, 1972, abandoned. This application Nov. 20, 1974, Ser. No. 525,591
Int. Cl.² C12D 13/06
U.S. Cl. 195—30 2 Claims

1. The process which comprises enzymatically transferring an amino group of a D-amino acid for the keto group of fluoropyruvic acid thereby forming the corresponding 3-fluoro-D-alanine.

3,929,577
PRODUCTION OF CEPHALOSPORIN C
Toshihiko Kanzaki, Hyogo; Tadazumi Fukita, Osaka, and Yoichiro Kono, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Sept. 30, 1974, Ser. No. 510,861
Claims priority, application Japan, Sept. 28, 1973, 48-109680
Int. Cl.² C12D 9/04
U.S. Cl. 195—36 R 3 Claims

1. A process for producing cephalosporin C which comprises cultivating *Cephalosporium acremonium* ATCC 20425 or *Cephalosporium acremonium* ATCC 20426 in a culture medium containing an assimilable carbon source and a digestible nitrogen source, to accumulate cephalosporin C in the culture medium, and recovering the accumulated cephalosporin C from the culture medium.

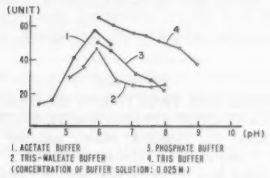
3,929,578
PROCESS FOR CULTIVATING ETHANOL-ASSIMILATING YEASTS
Teiri Urakami, Niigata, Japan, assignor to Mitsubishi Gas Chemical Co., Ltd., Japan
Filed Oct. 29, 1974, Ser. No. 519,019
Claims priority, application Japan, Nov. 9, 1973, 48-125976
Int. Cl.² C12B 1/00
U.S. Cl. 195—49 6 Claims

1. A process for cultivating ethanol-assimilating yeasts belong to species *Candida alcomigas*, *Torulopsis methanothermo*, *Torulosis enokii*, *Torulopsis methanophiles*, *Saccharomyces cerevisiae ellipsoideus* (IAM4140) *Hansenula alcolica*, *Saccharomyces steineri*, *Saccharomyces uvarum*, *Saccharomyces carlsbergensis* (OUT 7929), *Pichia farinosa miso mogi* (IAM 4526), *Candida utilis* (*OUT* 6020) or *Lipomyces sparkey*, using ethanol as a main carbon source, which comprises cultivating the yeasts in a culture liquor at an effective ethanol concentration of not more than 0.8 by weight based on the total weight of the culture liquor, a dissolved oxygen concentration of 0.1 to 30 ppm, a dissolved carbon dioxide concentration of 0.38 to 380 ppm, pH of 2.0 to 5.0 and temperature of 25° to 48°C.

3,929,579
DENTAL CARIES-INDUCING MICROORGANISM CELLS LYTIC ENZYME
Yoshio Yoshimura, Nishinomiya; Kanae Yokogawa, Nara, and Shigeo Kawata, Kobe, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 180,711, Sept. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,944, Sept. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,010, April 6, 1970, abandoned. This application July 11, 1972, Ser. No. 270,821
Claims priority, application Japan, June 7, 1969, 44-45307; May 28, 1970, 44-46494
Int. Cl.² C12D 13/10; A61K 19/00
U.S. Cl. 195—62 14 Claims

1. An enzyme capable of lysing cells of cariogenic streptococci produced by cultivation of a Streptomyces microorganism selected from the group consisting of Streptomyces dia-

statochromogenes (ATCC 21481), Streptomyces farinosus (ATCC 21482), Streptomyces globisporus (ATCC 21553)



and Streptomyces griseus Var. H-402 (ATCC 21483) and mutants thereof.

3,929,580

CREATINE PHOSPHOKINASE TEST INDICATOR

Peter Salvatore Forgione, Stamford, Conn., and Howard M. Robbins, Chicago, Ill., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 29, 1974, Ser. No. 501,587

Int. Cl.² G01N *31/14*

U.S. Cl. 195—99 **20 Claims**

1. A diagnostic test indicator for detection and concentration determination of creatine phosphokinase in sera comprising, in superimposed relationship,

A. an upper layer comprising a bibulous carrier material which has contained therein, at a pH of from about 7.2 to about 7.6, the dried residue resulting from the impregnation thereof with

1. creatine phosphate and
2. adenine diphosphate,

B. a middle layer comprising a cellulosic, bibulous material which has contained therein, at a pH of from about 7.1 to about 7.6, the dried residue resulting from the impregnation thereof with

3. glucose,
4. hexokinase
5. triphosphopyridine nucleotide,
6. glucose-6-phosphate dehydrogenase,
7. magnesium ion and
8. d-maltose and

C. a lower layer comprising a cast, water-soluble polymeric material which has contained therein, at a pH of from about 3.0 to about 6.0,

9. a tetrazolium salt and
10. phenazine methosulfate.

3,929,581

QUANTITATIVE DETERMINATION OF BLOOD AMMONIA

Friedrich da Fonseca-Wollheim, Berlin, Germany, assignor to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed May 17, 1974, Ser. No. 471,064

Claims priority, application Germany, June 7, 1973, 2329174

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **12 Claims**

1. Process for the quantitative determination of blood ammonia which comprises contacting a sample suspected of containing blood ammonia with glutamate dehydrogenase, α-ketoglutarate, and, as a coenzyme in the reduced state, nicotinamideadenine-dinucleotide phosphate in reduced form.

3,929,582

METHOD AND APPARATUS FOR CULTURING MICROORGANISMS

Maximilian Kellner, Untere Hauptstrasse 34, 805 Freising, Germany

Filed Feb. 13, 1974, Ser. No. 442,213

Claims priority, application Germany, Feb. 19, 1973, 2308087

Int. Cl. C12b *1/14*

U.S. Cl. 195—107 **9 Claims**

1. A method of culturing a microorganism in a closed system which comprises:

a. dispersing a feed gas in a liquid nutrient medium inoculated with the microorganism to be cultured at a rate sufficient to cause gas to be discharged from said medium,

1. the dispersed gas including a gaseous component,
2. a portion of said component being consumed by said microorganism during the culturing thereof, and
3. the non-consumed remainder of said component constituting a part of said discharged gas;

b. sensing the concentration of said component in said discharged gas;

c. generating a signal indicative of the sensed concentration;

d. replenishing said discharged gas with an additional amount of said component in response to said signal; and

e. recycling the replenished gas including said non-consumed remainder and said additional amount of said component to said medium for dispersal therein as feed gas.

3,929,583

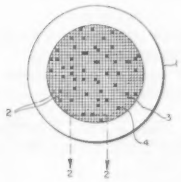
APPARATUS FOR ENUMERATING MICROORGANISMS

Anthony N. Sharpe, Aylmer, and Gregory L. Michaud, Manotick, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 14, 1975, Ser. No. 497,285

Int. Cl.² C12K *1/04*

U.S. Cl. 195—127 **10 Claims**



1. An apparatus to facilitate enumeration of microorganisms comprising a membrane filter element for retaining on a surface thereof the microorganisms present in a fluid sample filtered thereby, said filter element having imprinted on said surface, a barrier material, which restricts the spread of colonies through its physical properties, in a pattern defining a plurality of ordered, microbial colony isolating cells, wherein the cells are smaller in area than the normal colony area.

3,929,584

AUTOMATIC CARBON DIOXIDE INCUBATOR

Ernest Bryant Mansfield, Pittsburgh, Pa., assignor to Fisher Scientific Company, Pittsburgh, Pa.

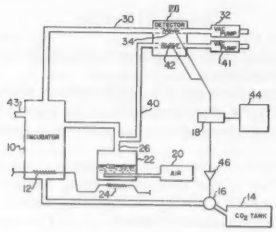
Filed Jan. 23, 1975, Ser. No. 543,360

Int. Cl.² C12B *1/00*

U.S. Cl. 195—127 **7 Claims**

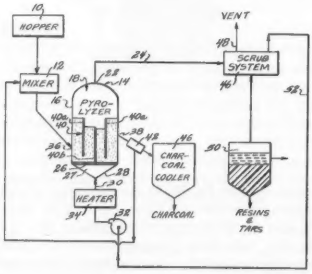
1. A control system for automatically and continuously maintaining a predetermined concentration of CO_2 in an incubator comprising:

A. means for supplying CO_2 to the incubator;
B. means for supplying water vapor and air to the incubator;
C. means for sampling the gaseous mixture in the incubator;
D. means for sampling the water vapor and air mixture supplied to the incubator;



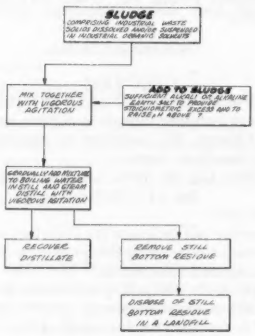
E. means for deriving electrical signals from the gas mixtures proportional to their respective thermal conductivities to obtain a difference signal;
F. means for comparing the difference signal with a preset signal proportional to the concentration of CO_2 desired in the incubator to obtain a control signal; and
G. means for regulating the supply of CO_2 to the incubator responsive to the control signal to maintain the concentration of CO_2 in the incubator substantially constant.

3,929,585
PRODUCTION OF CHARCOAL FROM SAWDUST IN A FLUIDIZED BED
Earl S. Grimmett, Idaho Falls, Idaho, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Aug. 16, 1972, Ser. No. 281,255
Int. Cl.² C10B *57/04*
U.S. Cl. 201—2.5 **4 Claims**



1. A method of disposing of wood refuse while simultaneously recovering charcoal and wood by-products without polluting the environment comprising: mixing the wood refuse selected from the group consisting of sawdust, wood chips and tree bark with about 40–60% by volume of an inert granular bed material which is from about −14 to 100 mesh in size selected from the group consisting of sand and alumina to form a feed mixture; passing the feed mixture into a fluidized bed containment vessel; fluidizing said mixture with an oxygen-free gas, thereby forming a fluidized bed; heating said fluidized bed to 280° to 1000°F to pyrolyze the wood refuse; maintaining the wood refuse in the bed until pyrolyzation of the refuse to charcoal and gaseous wood by-products is complete, the charcoal remaining with the bed material and the gaseous by-products being carried from the bed with the fluidizing off-gas; removing the charcoal and bed material from the vessel; separating the charcoal from the bed material; cooling the charcoal in an oxygen-free atmosphere while recirculating the inert bed material to be mixed with additional wood refuse; separating the gaseous by-products from the fluidized bed off-gas; recovering the by-products and venting the purified off-gas to the atmosphere.

3,929,586
PROCESS FOR TREATMENT OF ORGANIC SOLVENT-CONTAINING WASTE SLUDGES
George Slikkers, Jr., Holland, Mich., assignor to Organic Chemicals Company, Inc., Grandville, Mich.
Filed May 7, 1973, Ser. No. 357,902
Int. Cl.² B01D *3/34;* **C05F** *7/00;* **B01D** *5/00*
U.S. Cl. 203—37 **12 Claims**


SLUDGE
COMPRISING INDUSTRIAL WASTE SOLIDS DISSOLVED AND/OR SUSPENDED IN INDUSTRIAL ORGANIC SOLVENTS
MIX TOGETHER WITH VIGOROUS AGITATION
ADD TO SLUDGE
GRADUALLY ADD MIXTURE TO BOILING MIXTURE IN STILL AND STEAM DISTILL WITH VIGOROUS AGITATION
RECOVER DISTILLATE
REMOVE STILL BOTTOM RESIDUE
DISPOSE OF STILL BOTTOM RESIDUE IN A LANDFILL

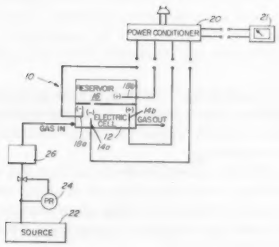
1. An industrial process for recovering land fill suitable solids from sludges composed of industrial waste solids and industrial organic solvents, said process comprising: mixing an alkali or alkaline earth metal salt into a sludge, said sludge being comprised of industrial waste solids selected from the group consisting of epoxy resins, polyester resins, phenolic resins, cellulosic fibers, polyolefins, vinyls, acrylics, and organic and inorganic ink and paint pigments, and being at least one of dissolved and suspended in industrial organic solvents selected from the group consisting of aliphatics, aromatics esters, ketones, aldehydes, alcohols, glycols, ethers and halogenated hydrocarbons, said mixing step including adding sufficient alkali or alkaline earth metal salt to provide a stoichiometric excess thereof based on the industrial waste solid constituents of said sludge and to create a mixture having a pH greater than 7; gradually adding the resultant mixture to boiling water in a still and effecting steam distillation of the resultant mixture; vigorously agitating said sludge and said alkali or alkaline earth metal salt during and in said mixing step and during said distillation step; recovering the industrial organic solvent through said steam distillation step; removing the still-bottom residue, comprising said industrial waste solids substantially organic solvent free, from the still and disposing of said solids in a land fill.

3,929,587
APPARATUS AND METHOD FOR MAINTAINING A STABLE ELECTROLYTE IN OXYGEN ANALYSIS
John P. Gallagher, Wilmington, Mass., assignor to Delta F Corporation, Woburn, Mass.
Filed Sept. 23, 1974, Ser. No. 508,351
Int. Cl.² G01N *27/28, 27/46*
U.S. Cl. 204—1 T **17 Claims**

1. In an electrolytic cell in which a component introduced into the cell is reduced at one cell electrode and oxidized at the other cell electrode and where a neutralization reaction

occurs forming neutralization products because of the introduction of components other than the components to be measured, thereby reducing the ionic transfer capacity of the electrolyte, the improvement which comprises:

a. first means to generate an electrolytic current between the cell electrodes;
b. a reservoir of electrolyte in communication with the electrolyte of the cell;
c. a first electrode disposed in the electrolyte of the reservoir;
d. a second electrode disposed in the electrolyte of the cell;
e. second means to generate an electrolysis current between the first and second electrodes said second means independent of the first means which current results in a pH gradient between said first and second electrodes and which current effects the migration of ionic species that may cause neutralization products to be formed in the electrolyte of the cell to the first electrode, the zone about the first electrode having a concentration of hydrogen ions such that the ionic species which tend to form neutralization products remain segregated from the electrolyte of the electrolytic cell; and
f. means to inhibit the back diffusion of said ionic species from the zone about the first electrode to the electrolyte of the cell.



6. A method of stabilizing an electrolyte in an electrolytic cell in which unwanted ionic species are formed during an electrochemical operation which includes:

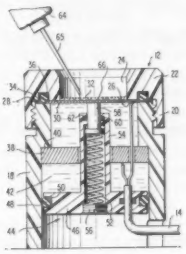
a. providing an electrolytic cell having a pair of sensing electrodes disposed therein, the electrodes specific for a component to be analyzed in a fluid stream, the electrodes completing a first electrolytic path;
b. providing a reservoir of electrolyte in communication with the electrolyte of the cell and including a second pair of electrodes, one of said electrodes disposed in the reservoir of electrolyte and the other of said electrodes disposed in the electrolyte of the cell, which pair of electrodes provides a second electrolytic path, the function of which path is independent of the function of the first electrolytic path;
c. imposing an electrical current between the second pair of electrodes resulting in a pH gradient between the electrolyte of the reservoir and the electrolyte of the cell to provide for the migration of other ionic species which are introduced into the electrolyte to the reservoir, which species do not directly affect reactions at the sensing electrode; and
d. restricting the back diffusion of the unwanted ionic species from the reservoir into the cell, whereby the unwanted ionic species remain segregated from the electrolyte of the electrolytic cell.

3,929,588

METHOD OF AND APPARATUS FOR DETERMINING THE OXYGEN CONTENT OF BLOOD

Frederick A. Parker, Broomall, and William R. Mac Bride, King of Prussa, both of Pa., assignors to Biomarine Industries, Inc., Devon, Pa.

Filed Aug. 3, 1973, Ser. No. 385,388
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **16 Claims**



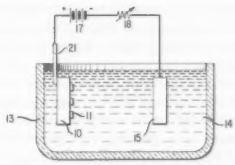
1. A blood oxygen analyzer comprising, a galvanic pO_2 sensor having an oxygen permeable membrane for receiving on one side thereof a sample of blood to be analyzed and having on the other side thereof a pair of electrodes and an electrolyte solution adapted to produce a voltage proportional to oxygen permeating through said membrane, a modifying circuit for modifying the sensor signals in accordance with the transfer function of oxygen from said blood sample through said membrane, utilization means connected to said modifying circuit for utilizing the signal therefrom, and means for supplying an enable signal to said utilization means after a predetermined time interval after receipt of a blood sample on said one side of said membrane to enable said utilization means to utilize the modified signal, which at the end of said predetermined time interval is a function of the pO_2 of the blood sample at the time the sample was deposited on said membrane.

3,929,589

SELECTIVE AREA OXIDATION OF III-V COMPOUND SEMICONDUCTORS

Felix Ermanis, Summit, and Bertram Schwartz, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1974, Ser. No. 440,657
Int. Cl.² C23B *11/02*; **C25D** *5/02*
U.S. Cl. 204—15 **19 Claims**



1. A method for forming an oxide on selected portions of the surface of a gallium containing compound semiconductor comprising the steps of:

forming a mask of a photoresist material over the surface of said semiconductor so as to leave exposed selected portions of the surface to be oxidized;
making the semiconductor the anode in an electrolytic cell wherein the electrolyte comprises H_2O and a material of the composition $(NH_4)_{3-x}\ H_x\ PO_4$ where $x = 0 - 2$, and passing a current through said cell so as to grow an oxide

into the exposed portions of the semiconductor surface; and

removing the photoresist mask from the surface of the semiconductor so as to leave the oxide on the selected portions of the surface.

3,929,590

METHOD OF APPLYING A FIRMLY ADHERENT COATING OF NON-METALLIC SUBSTANCES TO AN ELECTRICALLY CONDUCTIVE SUBSTRATE

Josef Heyes, Niederkasseler Strasse 114, 4 Dusseldorf, Germany

Filed Mar. 18, 1974, Ser. No. 452,160

Claims priority, application Germany, Mar. 16, 1973, 2313104

Int. Cl.² C25D 5/02

U.S. Cl. 204—16 13 Claims

1. A process for coating an electrically conductive substrate with a coating comprising a powdered nonmetallic hard substance bonded by a metal, the thickness of the coating being a multiple of the thickness of a particle of the powdered substance which comprises:

1. applying to said electrically conductive surface powder of a nonmetallic substance by electrophoresis whereby a porous coating is obtained;

2. thereafter compressing the so coated electrically conductive surface at a pressure of at least 1 kg per sq. cm.; and 3. subjecting the so compressionably coated electrically conductive surface to electroplating in an electrolytic bath containing a metal or metal alloy whereby the coating obtained in step 1 by electrophoresis is solidified galvanically by the deposition of said metal or alloy on said substrate and within the pores of said porous coating.

3,929,591

NOVEL LITHOGRAPHIC PLATE AND METHOD

Simon Long Chu, Dobbs Ferry, and Ken-Ichi Shimazu, Pleasantville, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,438

Int. Cl.² B41C 3/08; C25D 5/44

U.S. Cl. 204—17 9 Claims

1. A method for preparing an aluminum sheet base member for a lithographic printing plate, the surface of which is adapted to receive a light sensitive coating thereon, which comprises:

a. Graining the surface of said aluminum sheet by treatment thereof with a wet mass of fine, hard, abrasive particles, selected from the group consisting of silicates, oxides and sulfates; and

b. Etching said grained aluminum sheet by treatment thereof with alternating current in an aqueous electrolytic solution comprised of from 20 to about 50 percent by weight of phosphate electrolyte selected from the group consisting of alkali phosphates, alkaline earth phosphates, ammonium phosphate and phosphoric acid, and wherein the alternating current density is from about 10 to 200 amperes per square foot; said etching sufficient to increase the final surface reflectance of said aluminum sheet by at least about 5 percent; and

c. Anodizing said etched aluminum sheet by treatment with direct current in an aqueous electrolyte solution comprised of from 8 to 22 percent by weight of sulfuric acid, and wherein the direct current voltage is from 10 to 25 volts, and the current density is from 10 to 20 amperes per square foot, to provide a hard, abrasion resistant, porous surface on said aluminum sheet.

3,929,592

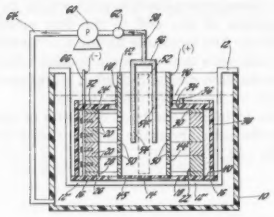
PLATING APPARATUS AND METHOD FOR ROTARY ENGINE HOUSINGS

Otto J. Klingenmaier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,688

Int. Cl.² C25D 7/04, 17/06

U.S. Cl. 204—26 4 Claims



1. An apparatus for uniformly electrodepositing a wear-resistant coating onto epitrochoidal radial working surfaces of a plurality of rotary engine housings simultaneously, said apparatus comprising:

a nonconductive substantially closed box-like enclosure for containing a vertical stack of abutting and registered rotary engine housings having aligned epitrochoidal inner working surfaces forming a passageway having an epitrochoidal cross section,

a flat metal plate on the top of said housing stack,

a flat metal plate on the bottom of said housing stack,

each of said flat metal plates having a major surface in contact with said stack and having an epitrochoidal opening therein congruent with said aligned inner surfaces,

top and bottom walls on said enclosure adjacent said metal plates with each wall having an epitrochoidal opening therein concentric with and smaller than the epitrochoidal cross section of said passageway,

an insoluble anode having a generally epitrochoidal transverse outer periphery and an interior space, said anode coaxially extending throughout said passageway parallel to and radially spaced inwardly from said aligned inner surfaces,

said anode being radially closer to said concentric epitrochoidal openings in said enclosure top and bottom walls than to said aligned inner surfaces,

said anode having a plurality of radially arrayed openings throughout said passageway that communicate said anode outer periphery with said anode interior space,

means for preventing said solution from entering said anode interior space except through said anode openings in said passageway,

means for supporting said enclosure in a tank of electroplating solution with said enclosure completely immersed in said solution, and

means for continuously withdrawing said solution from said anode interior space and recirculating it to said tank during electrodeposition of said wear-resistant coating onto said aligned inner surfaces.

3,929,593

METHOD OF FORMING COLORED OXIDE FILM ON ALUMINUM OR ALUMINUM ALLOY MATERIAL

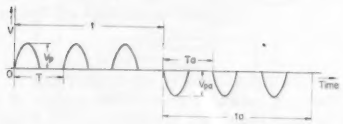
Noboru Sugiyama; Masahiro Takahashi; Hirosuke Kanamori; Ken Sato; Yoshio Hirayama, all of Shizuoka; Masahiro Mikamo, Tokyo; Toshiro Takahashi, Shizuoka; Toshihiro Nagano, Shizuoka; Kazuyoshi Kaneda, Shizuoka, and Isao Hara, Shizuoka, all of Japan, assignors to Riken Light Metal Industries Company, Ltd. and Nippon Light Metal Co., Ltd., both of, Japan

Filed Sept. 18, 1974, Ser. No. 507,216

Claims priority, application Japan, Sept. 21, 1973, 48-106656

Int. Cl.² C25D 5/48, 11/22, 5/18

U.S. Cl. 204—35 N 14 Claims



1. A method of forming a colored oxide film on an aluminum material by electrolyzing said aluminum material in an aqueous electrolytic bath containing a metallic salt by supplying said aluminum material serving as each electrode with a pulse voltage consisting of a plurality of unipotetial pulses whose polarity is inverted after every predetermined conduction time.

3. The method according to claim 1, wherein said aluminum material is electrolyzed by applying a pulse voltage whose positive and negative pulse waveforms are rectangular ones.

3,929,594

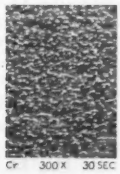
ELECTROPLATED ANODIZED ALUMINUM ARTICLES

Howard A. Fromson, Rogues Ridge Road, Weston, Conn. 06880

Continuation-in-part of Ser. No. 361,720, May 18, 1973, Pat. No. 3,865,700. This application Mar. 7, 1974, Ser. No. 449,162

Int. Cl.² C25D 5/00; B41C 3/08

U.S. Cl. 204—42 6 Claims



1. Lithographic printing plate having an aluminum substrate, a porous anodic oxide layer on the substrate, electrolytically deposited, randomly distributed discrete metal islands having a root portion anchored in one or more pores of the oxide layer, said islands extending from the root portion above the surface of the oxide layer thereby forming a composite anodized and discontinuously electroplated surface, and a layer of photosensitive material adhered to said anodized and electroplated surface.

3,929,595

ELECTROLYTIC BURNISHED GOLD BATH WITH HIGHER RATE OF DEPOSITION

Peter Biberbach, Grossauheim; Werner Dietschmann, Neuberg, and Hans-Joachim Lübke, Mutlangen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed Nov. 4, 1974, Ser. No. 520,844

Claims priority, application Germany, Nov. 7, 1973, 2355581

Int. Cl.² C25D 3/48, 3/62

U.S. Cl. 204—44 21 Claims

1. In an aqueous, acidic alkali gold cyanide bath suitable for the electrolytic deposition of gold the improvement comprising including in the bath a heterocyclic sulfonic acid selected from the group consisting of pyridine sulfonic acid, picoline sulfonic acid and quinoline sulfonic acid or a water soluble salt of such heterocyclic sulfonic acid in an amount sufficient to provide improved bright gold deposition from the bath.

3,929,596

ELECTRODEPOSITION OF WEAR RESISTANT AND OIL RETENTIVE NICKEL COATINGS AND ARTICLE HAVING SUCH A COATING

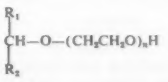
Takao Sasame, Hiroshima; Toshihiko Shigeta, Kure, and Toshio Yamada, Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Continuation-in-part of Ser. No. 294,298, Oct. 2, 1972, abandoned. This application Sept. 6, 1973, Ser. No. 394,855

Int. Cl.² C25D 15/00, 15/02

U.S. Cl. 204—49 13 Claims

1. In a method for providing wear resistance and oil retention in the surface of a workpiece by means of electroplating said workpiece in a nickel plating bath of an aqueous electrolyte to form a layer of nickel on said surface of said workpice, the improvement which comprises said nickel plating bath containing one or a mixture of powdered ceramic material of 0.5 to 9 microns particle size in an amount within the range of from 50 to 500 grams per liter of said plating bath and a surface active agent which is a non-ionic secondary alcoholic ethoxylate having the following formula;



wherein R_1 and R_2 are alkyl groups of 1 to 10 carbon atoms and n is an integer from 5 to 20, said ethoxylate having a molecular weight of from about 390 to 1,200, which is in an amount within the range of 0.5 to 5.0 percent by weight based on the total amount of said plating bath whereby the resultant nickel-plated layer on the surface of said workpiece contains therein particles of said powdered ceramic material and represents a porous structure such that liquid lubricating agent can be impregnated in said porous structure to provide sufficient lubrication for a coacting member with which the workpiece may cooperate in sliding engagement, the number of particles of said powdered ceramic material of 0.5 to 9.0 microns particle size in said porous structure are 250 to 2000 per 10,000 square microns and the number of porosities of 5 or more microns in diameter are more than 15 per 10,000 square microns.

10. A workpiece having formed on its surface an electroplated nickel layer, said nickel layer comprising ceramic particles contained therein, said nickel layer representing a porous structure with the number of said ceramic particles of 0.5 to 9.0 micron in particle size being within the range of from 250 to 2,000 per ten thousand square microns and the number of porosities of 5 or more microns in diameter being more than 15 per ten thousand square microns, whereby an improved wear resistance and an oil retention is imparted to the surface

of said workpiece.

12. The workpiece produced by the method of claim **1.**

3,929,597

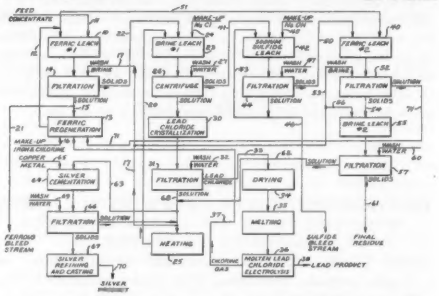
PRODUCTION OF LEAD AND SILVER FROM THEIR SULFIDES

Stephen M. Cottam, Osburn; Howard E. Day, Silverton, and William A. Griffith, Osburn, all of Idaho, assignors to Hecla Mining Company, Wallace, Idaho

Filed May 17, 1974, Ser. No. 470,719

Int. Cl.² C25C *3/34*

U.S. Cl. 204—66 **22 Claims**



1. The method of producing lead and silver from materials containing lead and silver sulfides along with the sulfides of zinc and iron, comprising: first leaching said materials with an aqueous water soluble ferric salt solution containing ferric ions to convert said sulfides to the corresponding salts of said lead and silver comprising a solid residue and generate the corresponding ferrous salt solution as a filtrate; separating said ferrous salt solution filtrate from said solid residue; second leaching the solid residue from the first leaching with aqueous sodium chloride brine to dissolve said lead and silver salts and provide a lead and silver salts solution and a further solid residue; cooling said lead and silver salts solution to crystallize and thereby separate said lead salts; removing the lead salt crystals from the resulting silver salt solution; and contacting said silver salt solution with metallic copper thereby to produce cement silver.

3,929,598

RECOVERY OF COPPER AND ZINC FROM LOW-GRADE NON-FERROUS MATERIALS

William R. Stern; Malcolm L. Jansen, and Bess L. Vance, all of Tucson, Ariz., assignors to The Anaconda Company, New York, N.Y.

Continuation-in-part of Ser. No. 280,718, Aug. 14, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,784

Int. Cl.² C25C *1/12, 1/16*

U.S. Cl. 204—108 **16 Claims**

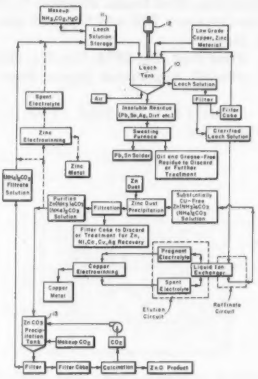
1. In a method for separating and separately recovering copper and zinc from low grade metallic scrap containing relatively large proportions of copper and zinc in association with relatively small proportions of other elements which comprises leaching the scrap with ammonium carbonate solution in the presence of oxygen to form a leach solution containing copper ammonium carbonate and zinc ammonium carbonate, and separating the resulting leach solution from the undissolved residue, the improvement which comprises

a. selectively removing the copper from the leach solution by treatment with a liquid ion exchanger, thereby producing as a raffinate an aqueous ammonium carbonate solution containing zinc in solution as zinc ammonium carbonate and substantially completely free of copper,

b. subsequently treating the liquid ion exchanger with an aqueous acid solution to form an aqueous acid eluant solution containing copper and substantially completely free of zinc,

c. treating the eluant solution to electrowin substantially pure copper therefrom,

d. introducing carbon dioxide into the raffinate solution while maintaining such solution under a substantial superatmospheric pressure, thereby precipitating a substantially pure zinc carbonate product,



e. separating the zinc carbonate precipitate from the residual ammonium carbonate solution and recovering zinc therefrom in the form of a substantially pure product, and

f. recycling said residual ammonium carbonate solution for re-use in leaching a further quantity of scrap.

3,929,599

PROCESS FOR REMOVING IRON FROM AN AQUEOUS ACID SOLUTION CONTAINING IRON AND COPPER

Morris A. Johnson, and Kang Yang, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 9, 1975, Ser. No. 539,757

Int. Cl.² C25C *1/12*; **C25B** *15/12*

U.S. Cl. 204—108 **9 Claims**

1. A process for removing iron ions from an aqueous acid solution without removing copper ions contained therein comprising the steps of:

combining activated carbon with said aqueous acid solution in an amount of at least about 0.01% by weight of said solution;

adjusting the pH of said acid solution to a value in the range of from about 2.0 to about 2.5 so that iron ions contained in said solution are hydrolyzed and precipitated but copper ions contained therein remain in said solution; and

then separating the precipitate from said acid solution.

3,929,600

PROCESS OF REMOVING AMMONIACAL NITROGEN FROM WASTE WATER

Toshihisa Hiasa, Nishiariba, and Hirohisa Ishimard, Arita, both of Japan, assignors to Iwao Engineering Co., Inc., Tokyo, Japan

Filed Apr. 3, 1975, Ser. No. 564,648

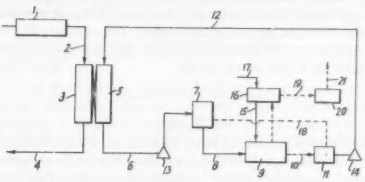
Claims priority, application Japan, Apr. 9, 1974, 49-40160; Feb. 20, 1975, 50-21362

Int. Cl.² C02B *1/82*

U.S. Cl. 204—149 **10 Claims**

1. A process for removing ammoniacal nitrogen from waste water by subjecting said water containing ammonium ions to adsorbtion on an ion-exchange substance and eluting the same comprising passing an alkaline eluant liquid containing alkali metal chlorides through the ion-exchange substance to elute the same, electrolyzing the liquid eluate containing the said ammonium ions to decompose the ammonium ion by the

oxidizing effect of chlorine thereby evolved, discharging the gas generated by said decomposition, adding to the electrolyzed liquid an adjusting liquid which contains a hydroxide of



the same alkali metal as that used in the eluant liquid to adjust the pH thereof and to supplement the alkali metal ion consumed in the foregoing steps, and recirculating the adjusted eluant to said ion-exchange substance.

3,929,601

SYNTHESIS OF PENTAFLUORIDES

Larned B. Asprey, and Robert T. Paine, Jr., both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 26, 1974, Ser. No. 454,983

Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 R **6 Claims**

1. A method of preparing pure pentafluorides comprising reacting at least one of the hexafluorides selected from the class consisting of, molybdenum, rhenium, osmium, and iridium hexafluoride, with one equivalent of hydrogen gas in the presence of ultraviolet radiation, at room temperature and for a period of about one day.

3,929,602

LOW TEMPERATURE IRRADIATION OF VITRIFIABLE MIXTURES OF UNSATURATED MONOMERS

Isao Kaetsu; Akihiko Ito, both of Takasaki, and Koichiro Hayashi, Sapporo, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Dec. 8, 1972, Ser. No. 313,396

Claims priority, application Japan, Dec. 10, 1971, 46-99472

Int. Cl.² C08F *2/48, 2/54*

U.S. Cl. 204—159.22 **12 Claims**

1. A process for preparing a resinous polymer at a low temperature which, in spite of the low temperature, can be carried out at a high polymerization rate, comprising:

1. uniformly mixing two or more organic compounds neither of which is vitrifiable independently and at least one of which is a polymerizable unsaturated monomer, said compounds being mixed in such a ratio as to give a vitrifiable mixture having a glass-transition point and a melting point, and having a temperature difference between said glass-transition point and said melting point of 70°C. or less; and
2. effecting polymerization by irradiating the mixture with an ionizing radiation or light at a temperature between said glass-transition point and 100°C. above said glass-transition point.

3,929,603

ELECTROLYTIC SENSOR WITH PRESSURE COMPENSATING MEANS

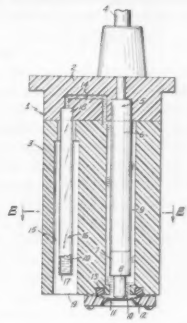
Joe A. Porter, Whittier, Calif., assignor to Uniloc, Inc., Irvine, Calif.

Filed Mar. 7, 1974, Ser. No. 449,139

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **4 Claims**

1. A cell for electrochemical analysis of a constituent in a sample comprising a body having an electrolyte reservoir therein, a pair of spaced electrodes positioned in said reservoir and adapted to be joined by an electrolyte in said reservoir, an opening communicating between said reservoir and the exterior of said body, a thin, flexible polymeric membrane permeable to said constituent and impermeable to electrolyte, means mounting said membrane under tension over one of



said electrodes and in a position to close said opening, and a passage in said body communicating between said reservoir and the exterior of said body wherein the improvement comprises an eliptically shaped, flexible, hollow tube connected to the exterior end of said passage, said tube having its end farthest from said passage closed so as to permit the tube to contian a quantity of an electrolyte.

3,929,604

METHOD FOR PRODUCING MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Tatsuji Kitamoto; Mahito Shimizu, all of Kanagawa; Akira Tasaki, Osaka, and Masaaki Suzuki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 25, 1974, Ser. No. 491,901

Claims priority, application Japan, July 25, 1973, 48-83836

Int. Cl.² C23C *15/00*; B05D *3/14*

U.S. Cl. 204—192 **10 Claims**

1. A method for producing a magnetic recording medium by ionic-plating having generally uniform magnetic characteristics in every direction comprising generating in a vacuum chamber and in a magnetic field a plasma of the glow discharge of a gas between a negatively-charged magnetic recording medium substrate and a positively-charged evaporative source of a ferromagnetic material and positioning the substrate in a magnetically concentrated zone of the plasma which is concentrated by the magnetic field, whereby the ferromagnetic material is evaporated and deposited on the magnetic recording medium substrate.

3,929,605

APPARATUS FOR QUICKLY EVALUATING GASES DISSOLVED IN BLOOD

Dietrich W. Lübbers, Dortmund, and Albert Huch, Marbach-,Marburg, both of Germany, assignors to Eschweiler & Co., Kiel, Germany

Filed Sept. 23, 1974, Ser. No. 508,633

Claims priority, application Germany, Sept. 22, 1973, 2255879

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 P **9 Claims**

1. A sensing apparatus for measuring the concentration of gas in a blood sample comprising:

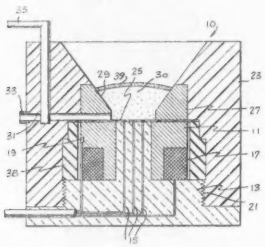
a temperature measuring element having a heater thermally connected thereto and responsive to control means for sensing the temperature of said temperature measuring

element and maintaining the same at a constant temperature,

an electrolytic sensing head, located within said temperature measuring element, having means for measuring the concentration of gas in the blood sample;

a membrane positioned adjacent said sensing head, said membrane being permeable to the gas of the blood sample and nonpermeable to the liquid of the blood sample;

a ring element made of a heat conductive material positioned adjacent said temperature measuring element and thermally coupled thereto, said ring element forming a reservoir for receiving a quantity of blood, said reservoir being formed by a conical bore extending through the ring element with the bottom of the reservoir being formed by the membrane extending across the opening of the bore, said reservoir having an inside diameter equal to its height, and capable of receiving a blood sample volume of 30 to 50 μl.

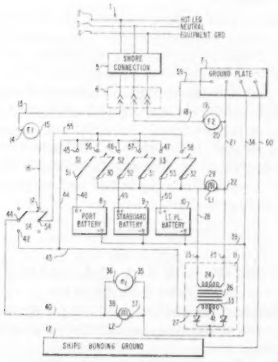


3,929,606

PROTECTION SYSTEM FOR THE METALLIC FITTINGS OF NON-METALLIC HULLS OF POWER BOATS

Ralph E. Wood, Lake Worth, Fla., assignor to Dunwood Development Corporation, Lake Worth, Fla.

Filed Jan. 18, 1973, Ser. No. 324,665
Int. Cl.² C23F *13/00*; B63B *17/00*
U.S. Cl. 204—196 **4 Claims**



1. In a system protecting the immersed metallic fittings of non-metallic hulls of docked power boats supplied by electrical power from a shorebased source of 3-wire customary voltage alternating current having a hot leg, a neutral leg, and an equipment ground;

at least one storage battery for supplying current for onboard use;

a marine battery charger and associated rectifier for maintaining the storage battery in operating condition;

a ground plate;

a ship's bonding ground, and

an electrical circuit in which the negative leads of the battery charger and associated rectifier, the storage battery, the equipment ground, and the neutral leg of the shorebased alternating current supply, are electrically connected with both the ground plate and the ship's bonding ground to avoid electrolysis.

3,929,607

ANODES FOR ELECTROCHEMICAL PROCESSES

Janusz Josef Henryk Krause, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 25, 1974, Ser. No. 445,783
Int. Cl.² C25B *11/02*, *11/04*
U.S. Cl. 204—286 **11 Claims**

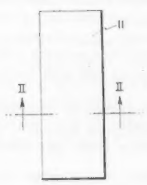
1. An anode assembly for an electrolytic cell comprising a foraminate structure of a film-forming metal comprising a current lead-in means including a plate, a plurality of longitudinal members spaced with their longitudinal axes parallel to one another and carrying on at least part of their surface an electrocatalytically active coating, each longitudinal member comprising a channel blade member including a pair of spaced-apart parallel blades and one or more bridge portions, said bridge portions being connected to the plate of the current lead-in means, the gap between the blades in the vicinity of said bridge portions being greater than the gap between the blades along the length of the member away from said bridge portions.

3,929,608

CATALYTIC MATERIAL FOR ELECTRODES

Louis Degueldre; Yves Gobillon, both of Brussels; Lucien Clerbois, Vilvoorde, and Louis Bourgeois, Brussels, all of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Continuation-in-part of Ser. No. 167,189, July 29, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,736
Claims priority, application Luxemburg, July 29, 1970, 61436. The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.
Int. Cl.² C25B *11/08*, *11/10*
U.S. Cl. 204—290 F **13 Claims**



1. Electrode for electrochemical processes comprising a conductive and inert substrate at least superficially comprising titanium or a titanium alloy and a protective and electrocatalytic coating covering at least a part of the surface of said substrate and adhered to said surface, said coating comprising:

a. at least one substance selected from among the group consisting of the platinum-group metals and their oxides, and

b. oxidized tellurium, the atomic ratio of b:a being 1:1–100.

3,929,609
METHOD AND APPARATUS USING SOLID SENSOR ELECTRODE

Don N. Gray, Sylvania, Ohio, and George G. Guilbault, New Orleans, La., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 328,360, Jan. 31, 1973. This application Jan. 8, 1975, Ser. No. 539,268

Int. Cl.² G01N 27/46

U.S. Cl. 204—1 T 16 Claims

9. In the method for electrochemically determining the end point of a titration wherein a titrant is added to a titrate and the titration is electrochemically monitored using a reference electrode and a noble metal electrode having a sensing surface in direct contact with said titrate, the improvement wherein said noble metal electrode has a sensing surface comprising the composite, solidstate, fusion product of a mixture of noble metal powder and powdered glass, fused to an inert substrate.

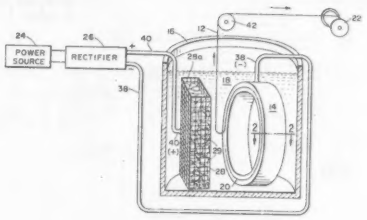
3,929,610
ELECTROFORMATION OF METALLIC STRANDS

Chih-Chung Wang, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed May 31, 1974, Ser. No. 475,098

Int. Cl.² C25D 1/04

U.S. Cl. 204—13 22 Claims



1. A method for continuously producing a metallic strand of indeterminate length, comprising the steps of

A. providing a cathode having a conductive portion with at least one exposed, narrow, closed-loop plating surface formed thereon, said plating surface being substantially strippable with respect to said metal, and an insulating portion in continuous contact with the edges of said plating surface and bonded to said conductive portions along a surface substantially perpendicular to said plating surface,

B. electrodepositing the metal on said plating surface with said plating surface totally immersed in a plating solution, and

C. removing the strand metal thus formed from said plating surface without interrupting said electrodepositing and without rotating said cathode.

3,929,611
ELECTRODEPOSITING OF ALUMINUM

Irving J. Hess, Philadelphia, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed July 19, 1974, Ser. No. 489,997

Int. Cl.² C25D 1/00

U.S. Cl. 204—14 N 13 Claims

1. The process of electroplating comprising the steps of plating aluminum from a non-aqueous plating bath comprising the steps of electrodepositing aluminum from a bath consisting of a mixture of anhydrous aluminum chloride at from 4.25 molar to saturation; and ether selected from the group consisting of ethyl ether, ethyl n-butyl ether, a mixture of ethyl and butyl ethers, anisole, phenetole, and di-phenyl ether; and a metal hydride selected from the group consisting of lithium hydride, lithium aluminum hydride and aluminum hydride.

3,929,612
PROCESS FOR ELECTROLYTICALLY COLORING THE ANODICALLY OXIDIZED COATING ON ALUMINUM OR ALUMINUM BASE ALLOYS

Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 21, 1974, Ser. No. 516,523

Claims priority, application Japan, Oct. 20, 1973, 48-118047

Int. Cl.² C25D 5/48

U.S. Cl. 204—35 N 8 Claims

1. In a process for electrolytically coloring an anodically oxidized coating on an aluminum or aluminum alloy article comprising subjecting said article to anodic oxidation in an aqueous anodic oxidation bath consisting essentially of sulfuric acid or an aromatic sulfonic acid to form an oxidized film of a thickness of at least 6 microns and electrolyzing said anodic oxidized article as a cathode immersed in an aqueous electrolytic coloring bath containing a water-soluble nickel salt selected from the group consisting of nickel sulfate, nickel chloride and nickel acetate using a direct current, the improvement of obtaining uniformly colored coating on the aluminum article by maintaining the pH of said electrolytic coloring bath in a range of from 2.0 to 5.5 during said electrolytic coloring treatment.

3,929,613
PREPARATION OF GLYOXYLIC ACID

Daniel Michelet, Tassin La Demi-Lune, France, assignor to Rhone-Poulenc, S.A., Paris, France

Filed Nov. 30, 1973, Ser. No. 420,576

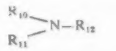
Claims priority, application France, Dec. 1, 1972, 72.42836. The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.

Int. Cl.² C25B 3/04

U.S. Cl. 204—77 10 Claims

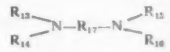
1. Process for the preparation of glyoxylic acid by cathodic reduction of oxalic acid, by carrying out an electrolysis in an electrolyser comprising a cathode, a cathode compartment, a separating diaphragm, an anode and an anode compartment wherein the said cathode compartment contains a catholyte consisting essentially of an aqueous solution of oxalic acid and 0.00005 to 1% w/w of an adjuvant chosen from:

a. tertiary amines of the general formula



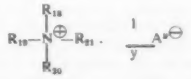
(I)

b. ditertiary diamines of the general formula



(II)

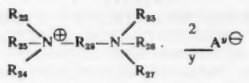
c. quaternary ammonium salts of the general formula



(III)

and

d. quaternary ammonium salts of the general formula



(IV)

in which

R_{10}, R_{11} and R_{12} each represent a linear or branched, saturated or unsaturated, aliphatic hydrocarbon radical, or two of R_{10}, R_{11} and R_{12} together represent a single saturated alkylene or oxydialkylene radical, or R_{10}, R_{11} and R_{12} can each represent an aliphatic radical containing at least one oxyalkylene link, at least one of the radicals R_{10}, R_{11} and R_{12} being an arylaliphatic radical, the radicals R_{10}, R_{11} and R_{12} together having less than 40 carbon atoms;

R_{13}, R_{14}, R_{15} and R_{16} each represent linear or branched saturated or unsaturated aliphatic hydrocarbon radicals, or an aliphatic radical containing at least one oxyalkylene links or at least one of R_{13} and R_{14} together or R_{15} and R_{16} together represent a single alkylene or oxydialkylene radical,

R_{17} represents an aliphatic or arylaliphatic, divalent hydrocarbon radical, the aliphatic chain or chains of which can be interrupted by oxygen atoms, the free valencies of the radical R_{17} being carried by aliphatic carbon atoms, and the total number of carbon atoms in the radicals R_{13}, R_{14}, R_{15}, R_{16} and R_{17} being greater than 6 and less than 40;

R_{18}, R_{19}, R_{20} and R_{21} each represent a linear or branched, saturated or unsaturated, aliphatic hydrocarbon radical, or an aliphatic radical containing at least one oxyalkylene links, or two of R_{18}, R_{19}, R_{20} and R_{21} together form a single saturated alkylene or oxydialkylene radical,

at least one of R_{18}, R_{19}, R_{20} and R_{21} being a monovalent aromatic hydrocarbon radical which is either purely aromatic, or arylaliphatic, or atomatic and having as substituents saturated or unsaturated, linear or branched, aliphatic radicals, the total number of carbon atoms in R_{18}, R_{19}, R_{20} and R_{21} being more than 15 and less than 40;

R_{22}, R_{23}, R_{24}, R_{25}, R_{26} and R_{27} are as defined for R_{13}, R_{14}, R_{15} and R_{16}; and R_{28} is as defined for R_{17}; the total number of carbon atoms in R_{22}, R_{23}, R_{24}, R_{25}, R_{26}, R_{27} and R_{28} being more than 8 and less than 40;

y is equal to 1, 2 or 3, and

$A^{y\ominus}$ is hydroxy or an anion such that AH_y represents an inorganic or organic acid.

3,929,614

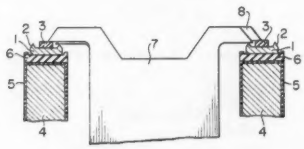
ELECTROLYTIC CELL HAVING MEANS FOR SUPPORTING THE ELECTRODES ON THE CELL WALL AND MEANS FOR SHORTING OUT THE ELECTRODES

Yoshihumi Hidohira, Takehara, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Japan

Filed Feb. 19, 1974, Ser. No. 443,635

Int. Cl.² C25C *7/00*

U.S. Cl. 204—242 **3 Claims**



1. In a metal salt electrolytic cell, the improvement being in that peak-shaped or circular projecting portions on which shoulder portions of the electrodes are hung are provided on both side portions of the electric conductors on the upper face of their cell wall and an insulating material is provided between said projecting portions at a distance from both projecting portions in such a manner that height of said insulating material is higher than that of the projecting portions and that one or more conductors for shorting the said conductors on the cell wall when electrodes are taken out are fixed in a vertical plane at the ends of the said conductors on the cell wall.

3,929,615

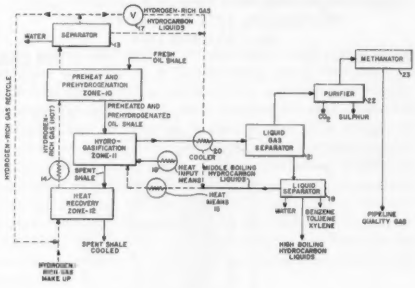
PRODUCTION OF HYDROCARBON GASES FROM OIL SHALE

Henry R. Linden, La Grange Park; Paul B. Tarman, Elmhurst, and Harlan L. Feldkirchner, Elk Grove Village, all of Ill., assignors to American Gas Association, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 365,973, June 1, 1973. This application Oct. 26, 1973, Ser. No. 409,914. The portion of the term of this patent subsequent to Dec. 25, 1992, has been disclaimed.

Int. Cl.² C10B *53/06*

U.S. Cl. 208—11 **12 Claims**



1. In the process for the production of pipeline quality gas by gasification of organic components of oil shale wherein above about 77 percent of the organic carbon in said oil shale is converted to liquids and gases the improvement comprising: introducing fresh oil shale into a preheat and prehydrogenation zone;

gradually preheating oil shale in a preheat and prehydrogenation zone to a temperature of about 700° to about 950°F. in the presence of hydrogen-rich gas with less than about 20 weight percent of the organic component of oil shale converted to liquid and gas in said preheat and prehydrogenation zone, said preheating at a rate of less than about 50°F. per minute above about 500° to 600°F. and said hydrogen-rich gas and shale passing countercurrently in said preheat and prehydrogenation zone;

hydrogasifying the preheated and prehydrogenated organic components of oil shale in a hydrogasification zone at a temperature of about 1200° to about 1500°F. in the presence of at least a stoichiometric amount of hydrogen-rich gas to form low molecular weight paraffinic gases and liquid hydrocarbons from the preheated and prehydrogenated organic portion of said oil shale;

said hydrogen-rich gas being supplied to said preheat and prehydrogenation zone in larger volumes than the hydrogen-rich gas supplied to said hydrogasification zone;

removing spent shale from the hydrogasification zone separate from said gases; and

purifying and upgrading said gases by removing liquids and undesired steam, carbon monoxide, carbon dioxide, ammonia and hydrogen sulfide followed by methanation to provide pipeline quality gas.

3,929,616
MANUFACTURE OF LUBRICATING OILS

Theodore C. Mead, Port Arthur; William B. Ashton, Nederland, and John P. Shillinglaw, Jr., Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 26, 1974, Ser. No. 483,255
Int. Cl.² C10G *13/00*
U.S. Cl. 208—87 **10 Claims**

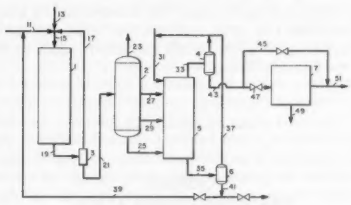
1. A process for the production of a lubricating oil which comprises contacting a residue-containing oil with a solvent having an affinity for aromatics to extract aromatic compounds from the oil, catalytically hydrocracking resulting raffinate, recovering from the hydrocracked product a fraction boiling in the lubricating oil range, subjecting said fraction to deasphalting treatment by contacting same with a low molecular weight paraffin and subjecting the deasphalted oil to a dewaxing treatment.

3,929,617
HYDROCRACKING EXTRACTION PROCESS FOR LUBES

H. Clarke Henry, and John B. Gilbert, both of Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 285,203, Aug. 31, 1972, abandoned. This application May 16, 1974, Ser. No. 470,608
Int. Cl.² C10G *37/00*
U.S. Cl. 208—96 **13 Claims**

IMPROVED HYDROCRACKING-EXTRACTION PROCESS FOR LUBES



1. A process for producing high VI, UV stable lubricating oil products from substantially asphalt-free lube feed stocks that have not been subjected to solvent extraction for the removal of aromatics therefrom, as an extract which comprises the steps of (a) passing said lubricating oil stock and hydrogen into a hydrocracking zone maintained at a pressure below about 1500 psig with the presence of a hydrocracking catalyst, thereby forming a hydrocrackate product containing lube oil components, (b) solvent extracting at least a portion of said hydrocrackate product with a solvent having preferential solubility for aromatics, thereby forming extract and raffinate phases, and (c) recycling a substantial portion of the extract phase, substantially free of solvent, to step (a), wherein it is introduced into the hydrocracking zone either separately or in combination with said lubricating oil stock.

3,929,618
PROCESS FOR THE CONVERSION OF HYDROCARBON FRACTIONS CONTAINING CONDENSED-RING POLYCYCLIC AROMATIC HYDROCARBON

Shiro Abiko; Kazuo Yorihiro, both of Yokkaichi; Toshiyuki Sugihara, and Masakazu Hanawa, both of Ami, all of Japan, assignors to Mitsubishi Co., Petrochemical Ltd., Japan

Filed Mar. 12, 1974, Ser. No. 450,395
Claims priority, application Japan, Mar. 15, 1973, 48-30205
Int. Cl.² C10G *13/06, 37/02*; B01J *29/12*
U.S. Cl. 208—111 **9 Claims**

1. A process for conversion of a hydrocarbon fraction containing at least 10 % by weight of condensed-ring polycyclic aromatic hydrocarbons which comprises hydrogenative ring opening and hydrocracking of said polycyclic aromatic hydrocarbons by hydrogen into substantially monocyclic aromatics and saturated cyclic hydrocarbons in the presence of a catalyst comprising 1 to 25% of nickel, 1 to 20% of tungsten and 0.1 to 5% of vanadium, based on the total weight of a carrier plus the three metals supported on said carrier, which carrier consists of an NaY zeolite in which more than 60 molar % of sodium ions have been exchanged with nickel ions.

3,929,619
HYDROCRACKING PROCESS WITH TRI-METALLIC CATALYST

John H. Sinfelt, Berkeley Heights; Allan E. Barnett, and James L. Carter, both of Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 380,833, July 19, 1973, Pat. No. 3,871,996. This application Jan. 30, 1975, Ser. No. 545,371
Int. Cl.² C10G *13/06*; C07C *3/58*
U.S. Cl. 208—111 **12 Claims**

1. A process for hydrocracking a petroleum feed stream which comprises contacting said feed stream with a catalyst comprising platinum, iridium and rhodium supported on an inorganic refractory oxide in the presence of hydrogen at reaction conditions whereby a petroleum fraction characterized as having a lower average molecular weight than the starting feed stream is obtained.

RJB

3,929,620
HYDROCRACKING CATALYST AND PROCESS

R. Parthasarathy, Silver Spring, and Julius Scherzer, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 4, 1974, Ser. No. 529,679
Int. Cl.² C10G *13/06*; B01J *27/04, 29/12*
U.S. Cl. 208—111 **5 Claims**

1. A method of hydrocracking a hydrocarbon feed stock to obtain lower boiling hydrocarbons which comprises subjecting said feedstock to hydrocracking conditions in the presence of a catalyst, said catalyst consisting of about 0.1 to 10 wt. percent nickel oxide, 10 to 25 wt. percent tungsten oxide and from 5 to 80% of a chromium containing ultrastable zeolite having an alkali metal content expressed as the oxide of less than 1 percent, a cubic unit cell of from 24.20 to 24.45 angstroms and an ultrastable structure as evidenced by retention of a surface area of greater than 150 m^2/g. after calcination of a temperature of 1725°F. for 2 hours.

3,929,621
COPPER CONTAINING HYDROCARBON CRACKING CATALYST

Roger J. Lussier, Ellicott City; John Storey Magee, Jr., Cooksville, and Edwin Wolf Albers, Annapolis, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

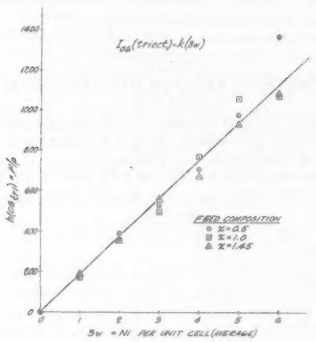
Division of Ser. No. 363,374, May 24, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,559
Int. Cl.² C10G *11/04*; B01J *29/12*
U.S. Cl. 208—120 **3 Claims**

1. A process for cracking hydrocarbons to obtain substantial yields of gasoline fractions of high aromatic and olefin content consisting essentially of contacting gas oil with a copper and hydrogen ion exchanged Type Y faujasite having a silica to alumina ratio in excess of 3.0, said faujasite having a copper content of 0.5 to 10% by weight as Cu O, at a temperature of 800° to 1000°F. for a period of 1 to 300 seconds.

3,929,622
HYDROCARBON CRACKING UTILIZING LAMINAR HEAVY METAL ALUMINOSILICATES

William T. Granquist, Houston, Tex., assignor to N.L. Industries, Inc., New York, N.Y.

Division of Ser. No. 291,252, Sept. 22, 1972, Pat. No. 3,852,405. This application Sept. 9, 1974, Ser. No. 504,679
Int. Cl.[2] C10G 11/04; B01J 29/28
U.S. Cl. 208—120 5 Claims



1. The process of cracking hydrocarbons which comprises contacting a hydrocarbon feedstock with a catalyst which is a laminar 2:1 layer-lattice aluminosilicate mineral possessing an inherent negative charge balanced by cations exterior to said lattice and corresponding to the following formula for a given embodiment:

$$\left[(G^{3}_{4-ew}\ Y^{2}_{3w})^{VI}\ (Q^{4}_{8-x}R^{3}_{x})^{IV}\ O_{20}\ (OH)_{4-f}\right]^{-}\cdot\left[\ d\ C^{y}\right]$$

$2 \leq e \leq 3$
$0.01 \leq w \leq 2$
$0.02 \leq ew \leq 4$
$0.05 \leq x \leq 2.0$
$f \leq 4$

wherein said first bracket represents said layer-lattice unit cell formulation and said second bracket represents said charge balancing cations; and wherein

G is at least 0.8 mol fraction aluminum ion, the remainder consisting of trivalent metal cations having an ionic radius not to exceed 0.75 A;

Y is selected from the class consisting of divalent metallic ions having an ionic radius not to exceed 0.75 A and mixtures thereof;

Q is at least 0.95 mol fraction silicon ions, the remainder consisting of tetravalent ions having an ionic radius not to exceed 0.64 A;

R is selected from the group consisting of trivalent ions having an ionic radius not to exceed 0.64 A and mixtures thereof; and

C is at least one charge-balancing cation, with y being its valence and d being the number of such cations C where: $dy = x + 3\,(e-2)w$, said contacting being at a temperature high enough to bring about cracking, and thereafter recovering the products resulting from said cracking.

3,929,623
LEAD/CHLORIDE/ALUMINA ISOMERIZATION CATALYST FOR GASOLINE

William T. Nelson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,940
Int. Cl.[2] C10G 35/06; B01J 27/06
U.S. Cl. 208—135 8 Claims

1. A process for reforming a gasoline comprising passing said gasoline into contact with a catalyst consisting essentially of

1. an alumina base;
2. chlorine in an amount within the range of 0.1 to 5 weight per cent calculated as hydrogen chloride based on the weight of said catalyst; and
3. 0.01 to 5 weight per cent lead calculated as PbO based on the weight of said catalyst

at a temperature within the range of 600° to 1200°F; and recovering a product having a higher octane rating.

3,929,624
REFORMING PROCESS USING A URANIUM-CONTAINING CATALYST

Evan Ellis Davies, Weybridge, and Christopher Ronald Pout, Feltham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jan. 26, 1973, Ser. No. 326,815
Claims priority, application United Kingdom, Feb. 7, 1972, 5548/72
Int. Cl.[2] C10G 35/08; B01J 27/06
U.S. Cl. 208—139 4 Claims

1. A process for the reforming of hydrocarbons boiling in the range 15°–204°C comprising contacting the hydrocarbons under reforming conditions of 300° to 600°C, 1 to 70 bars gauge, 0.1 to 10 v/v/hr and 0.1 to 20:1 hydrogen : hydrocarbon mole ratio with a catalyst comprising from 0.01 to 5% wt. of a platinum group metal, 0.01 to 5% wt. of uranium, 0.1 to 2% wt. of rhenium, and a silica-free alumina having a surface area of at least 150 m²/g, said catalyst being free of alkali metals and alkaline earth metals and other metals of Group VIA of the Periodic Table.

3,929,625
SHALE OIL PURIFICATION

Roy N. Lucas, Tokyo, Japan, assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 270,343, July 10, 1972, abandoned, which is a continuation of Ser. No. 742,549, July 5, 1968, abandoned. This application Aug. 2, 1974, Ser. No. 494,679
Int. Cl.[2] C10G 33/04
U.S. Cl. 208—188 9 Claims

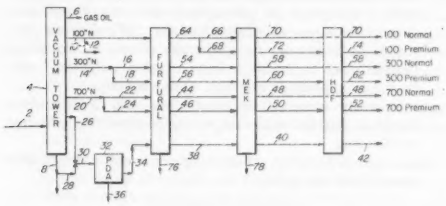
1. A process for separating a stable dispersion of suspended predominantly inorganic solids from shale oil produced by retorting oil shale, which process comprises

1. dispersing water in amounts sufficient only to form a shale oil-continuous dispersion into said shale oil containing a surface active chemical aid, said chemical aid having been added to said shale oil immediately after said shale oil had been retorted from oil shale and at a shale oil temperature not destructive to said chemical aid, said chemical aid comprising a polyoxyalkylene derived nonionic polymeric surfactant, said surfactant being derived from a nonionic polymeric precursor which is a polymeric hydrophobic compound with an active hydrogen reactable with alkylene oxides and having a molecular weight from about 150 to 1,500 and being selected from the group consisting of polyethylene amine and alkyl phenol formaldehyde resins wherein said alkyl group has four to eight carbon atoms, said precursor being reacted with said alkylene oxide to form said polymeric surfactant, said surfactant having a molecular weight from about 800 to about 27,000 and
2. then immediately resolving electrically said shale oil-continuous dispersion to coalesce said dispersion into (a) a shale oil phase with reduced inorganic solids content and (b) an aqueous phase containing said inorganic solids removed from said shale oil phase.

3,929,626
PRODUCTION OF LUBRICATING OILS BLENDING STOCKS

Harold O. Button, Yardley, Pa., and Robert A. Trimble, Pitman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,306
Int. Cl.² C10G 41/00
U.S. Cl. 208—309 9 Claims



1. In an operation for the production of a plurality of different lube stocks from a reduced crude and the recovery of higher boiling by-product material, the improvement which comprises processing a reduced crude through a low pressure drop vacuum tower maintained at a pressure below 50 mmHg arranged to separate a plurality of different relatively narrow boiling range lube base fractions from an overflash fraction boiling in an initial portion above 1000°F and a vacuum resid fraction, processing each of said relatively narrow boiling range fractions through a plurality of solvent extraction steps to remove undesired aromatics and wax sufficient to produce normal and premium grade lube blending fractions, processing said overflash fraction admixed with a portion of said resid fractions through propane deasphalting to produce a raffinate phase and an asphalt phase and processing the raffinate phase through solvent extraction to produce an improved bright stock.

3,929,627
MAGNETIC BENEFICIATION FOR MAGNESITE ORES

Antonios Frangiskos, and Theodor Gamboponlos, both of Athens, Greece, assignors to Financial Mining - Industrial and Shipping Corporation, Athens, Greece

Filed Dec. 6, 1974, Ser. No. 530,395
Claims priority, application Greece, Jan. 29, 1974, 3627
Int. Cl.² B03B 1/04
U.S. Cl. 209—9 5 Claims

1. A process for the recovery of pure magnesite from magnesite ores containing magnesite, serpentine and other gangue material, comprising:

crushing a quantity of magnesite ore;

conditioning the crushed ore in an aqueous suspension containing by volume 1 percent diesel oil and 0.15 percent of a mixture of cationic collectors comprising quaternary ammonium chlorides and primary amines for activating the surface of the serpentine and the other gangue material;

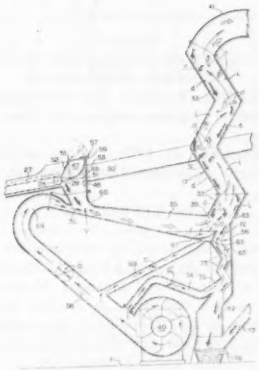
again conditioning the crushed ore in a suspension of a finely divided strongly ferromagnetic material so as to achieve selective absorption on the surface of the serpentine and the other gangue material as well as on the strongly siliceous and carbonaceous particles of the ore; and

removing the serpentine and the other gangue material as well as the strongly siliceous and carbonaceous particles of the ore from the remainder of the ore by means of a magnetic separator to obtain a concentrate of magnesite.

3,929,628
APPARATUS FOR REDUCING PRECONDITIONED GARBAGE TO A CLINKERLESS COMBUSTIBLE

Pietro G. Denevi; Mark B. DiDuca, both of Los Gatos; Billy J. Slane, and Thomas D. Vence, both of San Jose, all of Calif., assignors to Vista Chemical & Fiber Products Inc., New York, N.Y.

Filed Nov. 26, 1973, Ser. No. 418,830
Int. Cl.² B07B 9/02
U.S. Cl. 209—36 7 Claims



1. Apparatus for disposing of refuse such as garbage and the like from which heavier ferrous material has been removed and the remaining refuse ground up, shredded and dried as a preconditioned material; a closed air system for separating heavier, non-combustible elements in such material from lighter fractions therein preliminary to consumption of the latter by fire or conversion into useful products comprising:

a. a feed conveyor for feeding such preconditioned material to the closed air system;

b. a hopper for receiving such preconditioned material from said feed conveyor;

c. an air sealed gate at the open upper end of said hopper openable by discharge of such preconditioned material from said feed conveyor into said hopper;

d. an elongated tapering infeed duct having a restricted open end communicating with the lower end of said hopper for receiving such preconditioned material therefrom and declinding at a slight angle relative to horizontal from said restricted open end and expanding in area progressively therefrom toward a terminal end;

e. a stack of vertically disposed zigzag ducts having its lower end communicating with the terminal end of said elongated tapering infeed duct and providing a tortuous path discharging at its upper end;

f. a closed chambered storage bin communicating with the discharge upper end of said stack of zigzag ducts;

g. a blower, having a housing communicated with the restricted open end of said tapering infeed duct for creating a venturi action at the lower end of said hopper for transmitting such preconditioned material therefrom and for causing the incoming shredded, dried material to spread out and flow more loosely and opening through the gradually expanding elongated tapering infeed duct and into said stack of zigzag ducts for discharging lighter fractions from the latter into said storage bin;

h. an air return duct between said closed chambered storage bin and said blower for recirculating air from the bin to the blower;

i. a baffle wall projecting upwardly from the declining bottom wall of said elongated tapering infeed duct at the

open lower end thereof for providing a trough-like terminal end therein;

j. a perforated plate mounted in the trough-like terminal end of said infeed duct and extending tangentially from the bottom wall thereof toward the upper edge of said baffle wall for providing an air lift chamber therebetween; and

k. a supplemental air supply duct communicating said blower with said air lift chamber for supplying air through the perforated plate to creat an air cushion for lifting preconditioned material therefrom and into the air stream passing from said infeed duct into the lowermost one of said zigzag ducts in the stack thereof.

3,929,629
MATERIALS AND PROCESSES FOR FLOTATION OF MINERAL SUBSTANCES

Robert M. Griffith, Bradford, and Christopher Parkinson, Halifax, both of England, assignors to Allied Colloids Limited, England

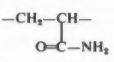
Filed Feb. 21, 1974, Ser. No. 444,505

Claims priority, application United Kingdom, Mar. 1, 1973, 10030/73

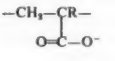
Int. Cl.² B03D *1/06*

U.S. Cl. 209—167 **7 Claims**

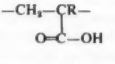
1. A method of concentrating cassiterite ore by subjecting an aqueous pulp of the ore to a froth flotation process in the presence of a collector and a gangue depressant, in which process the gangue depressant is a water soluble polymer containing from 40 to 100 mole percent recurring groups A and 0 to 60 mole percent recurring groups B, the mole percent being based on A+B, where A represents



and B represents



and/or



wherein R is hydrogen or methyl the polymer having a molecular weight distribution such that a solution of the polymer in water containing 10 percent by weight of the polymer has at pH 7 and a temperature of 25°C a Brookfield viscosity of between 8 and 50,000 centipoise.

3,929,630
PROCESS FOR BIOCHEMICAL REACTIONS

Pat E. Smith, San Antonio, Tex., assignor to Gary Aircraft Corporation, San Antonio, Tex.

Continuation-in-part of Ser. No. 285,241, Aug. 31, 1972, abandoned. This application Feb. 22, 1974, Ser. No. 444,928

Claims priority, application United Kingdom, Dec. 20, 1971, 59038/71

Int. Cl.² C02C *1/04*

U.S. Cl. 210—17 **4 Claims**

1. A process for reducing the BOD of a waste water stream comprising introducing the stream to a bed of shaped, porous and adsorbent silica substrate, the silica substrate having been formed by gelling and subsequent leaching of a soluble alkali metal silicate selected from the group consisting of sodium and potassium silicates to provide a porous, insoluble silica, the pores of which are of sizes from about 100 to about 800 microns.

3,929,631
COMPOSITIONS AND SYSTEMS TO RECOVER OILS FROM AQUEOUS AND SOLID SURFACES

Aniela Winkler, 120 Wilson Drive, Hazleton, Pa. 18201

Continuation of Ser. No. 725,529, April 30, 1968, abandoned. This application July 6, 1971, Ser. No. 160,204

Int. Cl.² C02B *9/02*

U.S. Cl. 210—36 **7 Claims**

1. The method of recovering hydrocarbon liquids dispersed in water which comprises:

forming porous predominantly hollow bodies of a polymeric substance selected from the group consisting of polystyrene, copolymers of polystyrene and mixed polymers thereof from an expandable form of said polymeric substance by heat popping at the site of said hydrocarbon liquids, said expandable form of said polymeric substances containing a meltable hydrocarbon;

subsequently immediately contacting said hydrocarbon liquids at said site with said porous predominently hollow bodies; and

removing said bodies containing absorbed hydrocarbon liquid from the water.

3,929,632
USE OF POLYMERIC QUATERNARY AMMONIUM BETAINES AS OIL-IN-WATER DEMULSIFIERS

Rudolf S. Buriks, and Allen R. Fauke, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 227,261, Feb. 17, 1972, Pat. No. 3,819,589. This application Mar. 19, 1974, Ser. No. 452,991

Int. Cl.² B01D *17/04*

U.S. Cl. 210—43 **11 Claims**

1. The process of demulsifying an oil-in-water emulsion which comprises treating said emulsion with an effective amount of a polymeric quaternary ammonium betaine which has no anions, the said polymeric betaine containing repeating units having a — COO^- group internally linked to a quaternary ammonium group and being derived from a dicarboxylic acid anhydride.

3,929,633
METHOD AND APPARATUS FOR CENTRIFUGALLY SEPARATING FINELY DIVIDED SOLIDS FROM AQUEOUS SUSPENSIONS THEREOF

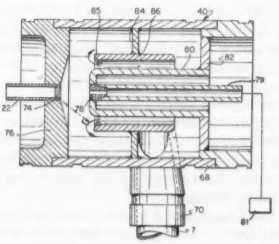
Jan Visman, Sydney, Canada, and Hassan A. Hamza, Cairo, Egypt, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 28, 1974, Ser. No. 446,903

Claims priority, application Canada, Mar. 29, 1973, 167482

Int. Cl.² B01D *21/26*

U.S. Cl. 210—49 **5 Claims**



1. A method of centrifugally separating finely divided solids from an aqueous suspension thereof, comprising:

a. feeding the aqueous suspension substantially tangentially into a cylindrical casing of a blender and swirling the aqueous suspension in a cylindrical, open ended vortex finder in the cylindrical casing to form, as a thin flowing

sheet of the aqueous suspension with the finely divided solids having wetted surfaces from the aqueous medium, a swirling hollow cone in the vortex finder flowing around a rim of the vortex finder,

b. spraying, as a conical spray, a solution of a water soluble, high molecular weight long chain flocculant substantially at right angles, with the kinetic energies of sprayed flocculant and that of flowing sheet flowing around the rim of the vortex finder matched, towards a side face of all of the portion of the flowing sheet flowing around the rim of the vortex finder so that the flocculant is sprayed into the flowing sheet flowing around the rim of the vortex finder and the flocculant and aqueous suspension are rapidly and intensively interspersed and the flocculant is adsorbed onto the wetted surfaces of the finely divided solids without totally wrapping individual finely divided solids by the flocculant molecules and without entrapping finely divided solids by premature bridging by the flocculant molecules,

c. maintaining the shape of the swirling hollow cone by pressurizing air within the swirling hollow cone with air from a nozzle which is fed within the swirling hollow cone into the hollow center thereof in the outwardly tapering direction of the swirling hollow cone so that the kinetic energies of the flocculant and that of the aqueous suspension are not dissipated by eddy currents and fluid masses that would otherwise tend to be in the way of the intersection of the sprayed flocculant and the swirling hollow cone,

d. feeding the aqueous suspension, with the said flocculant adsorbed onto the said wetted surfaces of the finely divided solids, from the blender to a flocculator and flocculating the finely divided solids, by means of the water soluble flocculant adsorbed onto the wetted surfaces, to form dense, strong flocs, which are predominantly large enough to be substantially separated from the aqueous medium by a cyclone separator, and

e. feeding the dense, strong flocs and aqueous medium to a cyclone separator and centrifugally separating a major portion of the dense, strong flocs from at least some of the aqueous medium by means of that cyclone separator.

3,929,634

REMOVAL OF MERCURY FROM AQUEOUS SOLUTIONS EMPLOYING NAVAL STORES PRODUCTS

Walter H. Schuller, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D. C. 20250

Filed Aug. 16, 1974, Ser. No. 498,164
Int. Cl.² C02B *1/20*
U.S. Cl. 210—49 **9 Claims**

1. A Process for removing mercury salts from an aqueous solution of said salts, said process comprising:

a. contacting the aqueous solution of mercury salt with about 0.05 to 2.0 weight percent, based on the weight of the solution, of a naval stores product having at least one carboxyl group;

b. agitating the mixture from (a) for about one-half hour to about 16 hours; and

c. filtering the solution from (b).

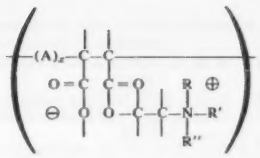
3,929,635

USE OF POLYMERIC QUATERNARY AMMONIUM BETAINES AS WATER CLARIFIERS

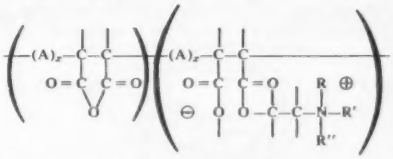
Rudolf S. Buriks, and Allen R. Fauke, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 227,261, Feb. 17, 1972, Pat. No. 3,819,589. This application Mar. 19, 1974, Ser. No. 452,638
Int. Cl.² B01D *21/01*
U.S. Cl. 210—54 **9 Claims**

2. The process of claim **1** where the polymeric quaternary ammonium betaine which has no anions has the repeating unit



or the repeating unit



where A is derived from an unsaturated group capable of copolymerizing with the dicarboxylic anhydride to form a polymer, R, R′ and R″ are aliphatic, arylic, cycloaliphatic or heterocyclic groups and are the same or different, and x is 1 or more, said unsatisfied valences in said formulae being hydrogen, hydrocarbon or substituted group.

3,929,636

PROCESS FOR CONDITIONING EFFLUENT CONTAMINATED BY ALDEHYDE COMPOUNDS

Jean-Pierre Zumbrunn, Saint Gratien, France, assignors to L'Air Liguide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes, Paris, France

Filed Dec. 26, 1973, Ser. No. 428,196
Claims priority, application France, Jan. 5, 1973, 73.00286
Int. Cl.² C02C *5/04*
U.S. Cl. 210—63 **10 Claims**

1. A process for treating industrial effluent containing aldehyde impurities, comprising:

adjusting the pH of said effluent to a value of at least about 9;

reacting the aldehyde impurities in said effluent with an oxidizing reagent comprising the peroxymonosulfuric anion, SO_5^{--}, by mixing said effluent with a compound or compounds which form the peroxymonosulfuric anion, SO_5^{--}, in said effluent, said oxidizing reagent being present in the effluent in a molar ratio of oxidant/aldehyde at least equal to 1.

3,929,637

DEODORIZING PROCESS

Albert E. Appleby, and Tommy G. Simpson, both of Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed July 25, 1973, Ser. No. 382,495
Int. Cl.² C02B *1/34*
U.S. Cl. 210—63 **15 Claims**

1. A method for deodorizing the distillation residue from the preparation of organophosphorus compounds having the formula $RyP(L)_zX_{3-y}$, wherein R is substantially an alkyl or aryl group, L is S or O, X is halogen, y is 1 or 2 and z is 0 or 1, which comprises

1. hydrolyzing said residue with water containing an amount of surfactant effective to retard tarry sludge formation and

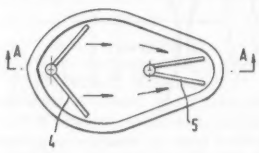
2. treating the hydrolysate from (1) with an amount of base selected from the group consisting of KOH, NaOH, NH_3 and NH_4OH, effective to at least neutralize the hydrolysate and an effective amount of inorganic oxidizing agent selected from the group consisting of sodium hypochlorite, ferric chloride, and water soluble permanganates

whereby the odor of the resultant treated residue is reduced.

3,929,638
REMOVAL OF SLAG FROM A METALLURGICAL VESSEL

Albert Hamilius, Destelbergen, Belgium, assignor to Centre de Recherches Metallurgiques— Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Aug. 20, 1974, Ser. No. 498,939
Claims priority, application Belgium, Aug. 22, 1973, 803921
Int. Cl.² B01D *21/04*
U.S. Cl. 210—65 **2 Claims**

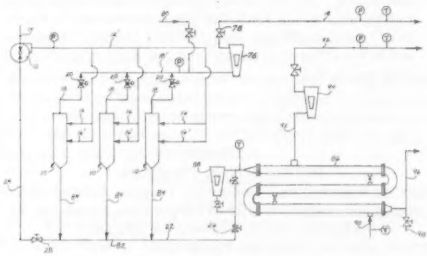


1. A method of removing slag from the surface of molten metal in a vessel having an outlet, by means of a scraper which comprises two scraping arms articulated together about a common axis, the method comprising the sequential steps of placing the scraper on the metal at a point diametrically opposite the outlet, with the common axis of articulation perpendicular to the surface, adjusting the angle between the arms so that the maximum area of the surface may be scraped, and moving the scraper across the surface towards the outlet and modifying the angle between the arms according to the remaining surface area to be scraped, so as to prevent slag from escaping laterally at the ends of the arms.

3,929,639
FILTERING APPARATUS AND PROCESS

James Keith Turner, Lincolnton, and Gary L. Parsons, Gastonia, both of N.C., assignors to Gaston County Dyeing Machine Company, Mount Holly, N.C.

Filed July 23, 1973, Ser. No. 381,798
Int. Cl.² B01D *35/22*
U.S. Cl. 210—71 **6 Claims**

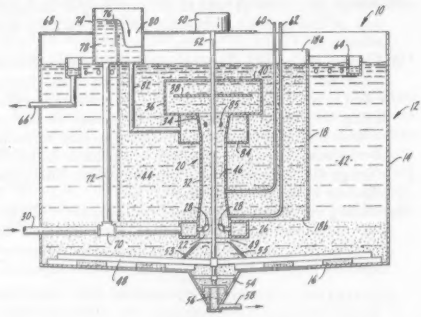


1. Apparatus for filtering contaminating solids and reclaiming heat from a heated aqueous effluent in the course of conditioning the effluent in substantial part for reuse, said apparatus comprising a plurality of filter units each of which comprises an elongate cylindrical housing having a tubular filter cartridge disposed in fixed relation coaxially and substantially coextensively therein and proportioned in cross section to leave an annular circulation space about said cartridge within said housing, means for supplying said effluent continuously to said filter units in parallel, said supply means being arranged for delivering effluent tangentially into said circulation space at a plurality of points spaced lengthwise of the housing of each filter unit, means for carrying off filtered effluent from the outlet side of each filter unit of said plurality, means for recirculating residual unfiltered effluent from the inlet side to said filter unit supply means which comprises a drain line from each filter unit connected to a common manifold having a recirculating line running therefrom to said filter unit supply means and having a common drain line fitted thereat, said common drain line being valved for throttling to force recirculation of a predominant portion of unfiltered effluent draining from said circulation space, means for selectively closing the means for carrying off filtered effluent from the filter units of said plurality so that any of said filter units may be regenerated by the cleansing action of effluent circulation therethrough only at said inlet side while the remainder of said filter unit plurality continues in operation, and a heat exchanger, together with means for supplying clear aqueous make-up through said heat exchanger, and means for bleeding a corresponding portion from said recirculating effluent through said heat exchanger in heat exchange relation with said make-up supply.

3,929,640
WATER TREATING APPARATUS

Edward H. Dohnert, East Brunswick, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Apr. 27, 1972, Ser. No. 248,231
Int. Cl.² C02B *1/10*; B01D *19/04*
U.S. Cl. 210—195 **10 Claims**



1. The water treating apparatus comprising:
a tank;
a partition within said tank defining a settling zone;
means for removing treated water from said settling zone;
an uptake member within said partition defining a mixing and recirculation zone, said uptake member including a lower opening;
a plurality of upwardly directed nozzles connected to an intake means, said nozzles being disposed within said uptake member and within the perimeter of said lower opening in said uptake member; and
precipitate collecting means underlying said lower opening whereby precipitates from said collecting means are mixed with liquid passing through said nozzles in said uptake member and are passed into said mixing and recirculation zone.

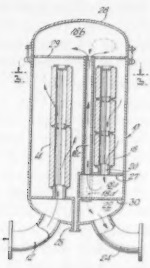
3,929,641
ELECTROSTATIC CHARGE REDUCTION IN FILTER-SEPARATORS

William G. Dukek, Summit, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 427,513, Dec. 26, 1973, abandoned.
This application Feb. 3, 1975, Ser. No. 546,424
Int. Cl.² B01D *29/42*
U.S. Cl. 210—73 **10 Claims**

1. A method for reducing the static electrical charge developed in fuels during the filtering and separation of free water therefrom in a multi-stage filter-separator vessel having an outlet including the following steps: passing static charged fuel

from the last stage of the filter-separator to at least a first holding chamber; holding said fuel in at least said first holding chamber for a sufficient holdup time to permit substantial



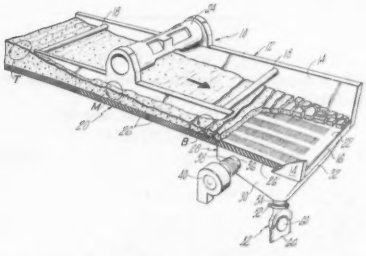
relaxation of the static charged fuel whereby the static charge in said fuel is substantially reduced; and passing the relaxed fuel out of said vessel.

3,929,642

DEWATERING SYSTEM

Robert E. Ennis, West Simsbury, Conn., and Robert G. Derrick, Buffalo, N.Y., assignors to Linatex Corporation of America, Stafford Springs, Conn. and Derrick Manufacturing Corporation, Buffalo, N.Y.

Filed Mar. 7, 1974, Ser. No. 448,937
Int. Cl.² B01D *33/38*
U.S. Cl. 210—113 **7 Claims**



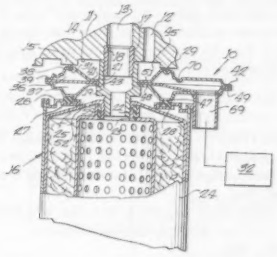
1. In a dewatering system for granular solid material comprised of an elongated vibratory screen deck having a top surface along which a bed of solid granular material travels relative to said top surface during dewatering and a discharge edge at one end thereof, the combination including a vacuum compartment positioned beneath a screen panel portion of said deck adjacent said one end, said compartment being in communication with the underside of said panel portion for assisting in removal of additional amounts of fluid from the bed of solid material moving relative to the vibratory overlying top surface, an air pump associated with said compartment for producing a pressure drop between said top surface and said underside of the panel portion overlying the chamber and a water discharge regulator for periodically discharging water from said compartment in response to the amount of water accumulated therein, said water discharge regulator being a self-operating, flexible member having a neck portion and a diaphragm portion movable between an open discharge position and a closed sealed position, said diaphragm portion depending integrally from said neck portion and having a reinforced top section and a central stabilizing pad extending downwardly therefrom, said central stabilizing pad being operative for constantly biasing said diaphragm portion into its closed flat position and being movable into its open position in response to the water pressure within the compartment acting on said reinforced section.

3,929,643

FLUID DIVERTER DEVICE WITH PRESSURE RELIEF VALVE

Desmond M. Donaldson, Halton, and Gregory S. T. Millard, Peel, both of Canada, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 351,755, April 16, 1973, Pat. No. 3,862,037. This application May 28, 1974, Ser. No. 473,615. The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.² B01B *23/20*
U.S. Cl. 210—117 **10 Claims**



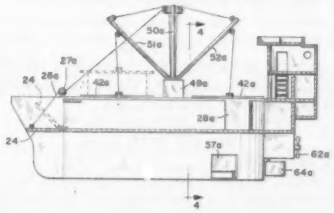
1. A fluid diverter device adapted to be disposed in a fluid flow path to divert fluid to a fluid treating apparatus and return the fluid to its original path, comprising first and second dished plates defining a hollow casing, said first plate having inlet means for flow of fluid into said casing and said second plate having outlet means for flow of fluid from said casing, a baffle plate disposed between and engaging said casing plates and dividing said casing to provide spaced independent first and second fluid chambers respectively communicating with said inlet and outlet means, said plates having coextensive engaged tab portions, the tab portions of said first and second plates extending from said fluid chambers and overlying and being in spaced relation to the tab portion of said baffle plate to provide spaced fluid passages therein, spaced conduit means respectively connected to said spaced fluid passages defined by said tab portions for flow of fluid from said first chamber to said fluid treating apparatus and for flow of fluid from said apparatus to said second chamber, and means to by-pass the fluid treating apparatus and cause liquid flow directly from said first chamber to said second chamber.

3,929,644

WATERCRAFT FOR SCAVENGING OIL SPILLAGE

George M. Fletcher, 456 Lee St., Oakland, Calif. 94610

Filed Dec. 28, 1970, Ser. No. 101,964
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 **5 Claims**



1. A watercraft for scavenging oil and other floating debris from the surface of a body of water, comprising: a buoyant

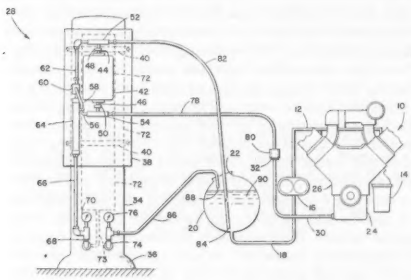
hull adapted to be propelled in such body of water and being equipped with a receiving tank having a substantial volume thereof extending downwardly below the surface of such body of water; an inlet system communicating with said tank and having a mouth located along the surface of such body of water to afford ingress of a surface layer thereof and delivery of such surface layer into said tank; a discharge system providing an exit opening for said tank at an elevation substantially below the surface of such body of water; and transversely spaced and longitudinally extending wall surfaces provided by said hull and defining an open ended flow passage below the surface of such body of water having a varying transverse cross section constituting a venturi through which water is forced to flow as said craft is propelled, said exit opening being disposed adjacent a lower-pressure area of said flow passage whereby the pressure adjacent said exit opening is reduced as said craft moves through such body of water so as to remove water accumulations from the lower portions of said tank and thereby enable the same to receive their greater quantities of scavenged debris.

3,929,645

FILTERING AND MIXING APPARATUS

William G. Bugelski, and Robert E. Teasley, Jr., both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 24, 1974, Ser. No. 472,936
Int. Cl.[2] B01D *29/00*
U.S. Cl. 210—251 **15 Claims**



1. A system for addition of used lubricating oil to fuel oil burned by a compression ignition engine, said system comprising:

means for extracting used lubricating oil from said compression ignition engine;

means for mixing fuel oil with said extracted lubricating oil and discharging the mixture of fuel oil and used lubricating oil from a common outlet;

a filter having an inlet connected to the outlet of said mixing means for filtering contaminates from said mixture; and,

means for adding said mixture to a tank of fuel oil for use by said compression ignition engine.

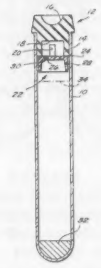
3,929,646

SERUM SEPARATOR AND FIBRIN FILTER

Stanford L. Adler, Monsey, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed July 22, 1974, Ser. No. 490,539
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—359 **3 Claims**

1. An article for use for the centrifugal separation of a blood sample into a plasma or a serum portion, constituting a lighter phase, and a cellular portion, constituting a heavier phase, for the formation of a barrier therebetween, comprising: a tubular container having an open outer end and a closed inner end; an inner cover element of relatively rigid material in said container adjacent said open end, said cover element comprising a platform-forming transverse relatively thin wall portion substantially filling the cross section of said container and at its circumferential extremity a depending relatively thin side wall portion having an inner surface tapering so as to narrow toward said transverse wall portion, said transverse wall portion defining straight-through plural normally open filter and vent openings dimensioned to pass said phases, said wall portions together defining a cavity, the height of said said inner



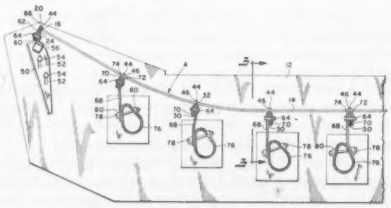
cover element being at least half the diameter thereof, and a sealant comprising a semifluid in said container closed end, said cover element and said sealant having respective specific gravities intermediate the respective specific gravities of said two phases, so that on separation of said two phases said sealant forms a barrier therebetween with said sealant sealing against said container and further sealing against at least the inner surface of said side wall structure and occluding said vent openings.

3,929,647

SCREENING APPARATUS

Joseph E. Kempa, Iron Mountain, Mich., assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Oct. 10, 1973, Ser. No. 404,997
Int. Cl.[2] B07B *1/12, 1/46*
U.S. Cl. 209—395 **14 Claims**



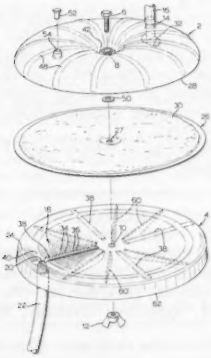
1. Screening apparatus comprising an upper screen deck, said upper screen deck including a plurality of elongated spaced-apart parallel rods having upstream and downstream end portions, support means for supporting said rods at said upstream and downstream end portions and at a plurality of longitudinally spaced locations intermediate said upstream and downstream end portions, said support means including a plurality of transversely extending elastomeric strips having holes therethrough snugly receiving said rods at said upstream and downstream end portions and at a plurality of longitudinally spaced locations intermediate said upstream and downstream end portions, and a lower screen deck extending outwardly from said downstream end portions of said upper screen deck rods, said lower screen deck including a plurality of elongated spaced-apart lower screen deck rods having upstream and downstream end portions, said strips including

a common strip having vertically spaced upper and lower rows of said rod receiving holes, said downstream end portions of said upper screen deck rods being snugly received in said upper row of holes and said upstream end portions of said lower screen deck rods being snugly received in said lower row of holes, and said lower screen deck rods being additionally supported at longitudinally spaced locations by a plurality of said elastomeric strips, said common strip being secured to a support bracket extending substantially the full length of said common strip, said support bracket overlying said lower row of holes in said common strip on the opposite side into which said upstream end portions of said lower screen deck rods are received to preclude extension of said upstream end portions of said downstream screen deck rods completely therethrough, the upper edge of said support bracket terminating beneath said upper row of holes in said common strip, and a backing plate on the opposite side of said common strip into which the downstream end portions of said upper screen deck rods extend to preclude extension of said downstream end portions of said upper screen deck rods completely therethrough, said backing plate having a row of holes therethrough for passage of said upstream end portions of said lower screen deck rods into said lower row of holes in said common strip as aforesaid.

3,929,648
FILTER UNIT

Arthur Robert Cuthbert, 15 Fletcherdon Crescent, Downsview, Ontario, Canada

Filed May 7, 1974, Ser. No. 467,715
Claims priority, application Canada, Sept. 4, 1973, 180219
Int. Cl.² B01D *29/04*
U.S. Cl. 210—445 **10 Claims**



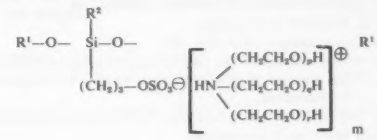
1. A filter unit comprising:
a first housing member having a fluid inlet;
a second housing member having a fluid outlet, an irregular central surface portion and a smooth generally planar peripheral surface portion;
a generally flat filter paper overlying said irregular and peripheral surface portions with said irregular surface portion providing drainage paths to said fluid outlet;
said first housing member being configured and positioned to define a filter chamber between itself and said filter paper and having a peripheral edge opposite said smooth peripheral surface of said second housing member with said filter paper therebetween; and
fastening means extending centrally through said housing members and serving to clamp them together and to clamp the periphery of said filter paper therebetween, said fastening means holding the central portion of said second housing member resiliently flexed toward the first housing member whereby to maintain sealing pressure between said members and the peripheral portion of said filter paper.

3,929,649
FIRE EXTINGUISHING FOAM CONCENTRATE

Gerd Rossmy, Essen-Werden, and Götz Koerner, Essen, both of Germany, assignors to Th. Goldschmidt AG, Germany

Continuation-in-part of Ser. No. 197,477, Nov. 10, 1971, abandoned, which is a continuation of Ser. No. 865,171, Oct. 9, 1969, abandoned. This application Mar. 19, 1973, Ser. No. 342,888
Claims priority, application Germany, Oct. 9, 1968, 1802052
Int. Cl.² A62D *1/00*
U.S. Cl. 252—3 **6 Claims**

1. In a fire extinguishing foam concentrate, the improvement which comprises that its active ingredient is a water-soluble, surface active organosilicon compound, said compound constituting at least 10 percent of said concentrate and having the formula



wherein
R^1 is $(CH_3)_3Si$;
R^2 is CH_3 or $(CH_3)_3SiO$;
$m = 1$–3;
$p, q, r = 0$–7 and
$p + q + r = 1$–20.

3,929,650
EXTREME PRESSURE AGENT AND ITS PREPARATION

John M. King, San Rafael, and Nicolaas Bakker, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 22, 1974, Ser. No. 453,898
Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33.4 **23 Claims**

1. A process for preparing a particulate alkali metal borate dispersion which comprises contacting an alkali metal carbonate overbased alkali or alkaline earth metal sulfonate with boric acid within a stable inert oleophilic liquid reaction medium, wherein said contacting is conducted at a temperature of 20° to 200°C for a period of 0.5 to 7 hours and wherein the molar ratio of boric acid to alkali metal carbonate is from 1 to 3.

3,929,651
MODIFIED LITHIUM SOAP GREASE

Donald W. Murray, Sarnia, and Warren C. Pattenden, Mooretown, both of Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 90,877, Nov. 18, 1970, abandoned. This application Sept. 25, 1974, Ser. No. 509,231
Int. Cl.² C10M *1/24, 3/18, 5/14, 7/20*
U.S. Cl. 252—41 **8 Claims**

1. A lubricating grease composition of high dropping point and long oxidation life which comprises a major proportion of a lubricating oil and from about 2 to 30 weight % of a thickener system whose essential components include a dilithium salt of a C_6–C_{12} dicarboxylic acid, a lithium soap of a C_{12} to C_{24} hydroxy acid, and a lithium salt of a hydroxy aromatic carboxylic acid having a maximum of 14 carbon atoms, wherein the hydroxy group is attached to a carbon atom not more than 6

carbon atoms removed from the carboxyl group, in a weight ratio of about 0.5 to 15 parts of hydroxy fatty acid per part of said dicarboxylic acid, and in a weight ratio of from about 0.025 to 2.5 parts of said hydroxy aromatic carboxylic acid per part of dicarboxylic acid, said lithium salt of hydroxy aromatic carboxylic acid having been prepared by reacting lithium base with hydroxy aromatic carboxylic acid or lower alcohol ester thereof in the presence of dilithium salt of dicarboxylic acid and lithium soap of hydroxy fatty acid.

3,929,652

DUAL PURPOSE CUTTING OIL

Leonard S. Seni, Port Arthur, Tex.; James E. Davis, Summerville, S.C., and Henry R. Harrison, River Rouge, Mich., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 13, 1974, Ser. No. 523,301

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 **10 Claims**

1. A lubricant comprising

a. a major amount of a base oil,

b. a minor amount of a chlorophenyl polysulfide and

c. a minor amount of a mercapto-thiadiazole.

10. A lubricant comprising:

a. a major amount of a base oil,

b. a minor amount of Bis (β-chlorophenethyl) disulfide,

c. a minor amount of an alkyl derivative of 2,5-di-mercapto-1,3,4-thiadiazole,

d. a minor amount of a mixture of alkylmaleic acid phenol and lauric acid phosphate,

e. a minor amount of a copolymer of ethylene and propylene and

f. oil of citronella.

3,929,653

LUBRICANT ADDITIVES

John Scotchford Elliott; Gerald John Joseph Jayne, and Herbert Frank Askew, all of Bracknell, England, assignors to Edwin Cooper & Company Limited, Bracknell, England

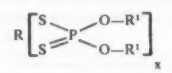
Division of Ser. No. 342,088, March 16, 1973, abandoned. This application June 18, 1974, Ser. No. 480,363

Claims priority, application United Kingdom, Mar. 22, 1972, 13431/72

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 **14 Claims**

1. A lubricating composition comprising a major amount by weight based on the total weight of the composition, of a lubricating oil and a minor amount, conferring antioxidant or anti-wear properties, by weight of an oil-soluble, ashless additive compound having the formula:



wherein:

i. R is selected from the group consisting of (a) a residue of a monocyclic, non-conjugated olefin containing from 8 to 12 carbon atoms and at least two ethylenically unsaturated double bonds in the ring and (b) the residue of the product formed by reacting at least one, but not all, of the ethylenically unsaturated double bonds in said monocyclic, non-conjugated olefin with a compound selected from the group consisting of sulphur, phosphorus pentasulphide, a mercaptan, phenol, thiopenol, and thiocyanate anion;

ii. each R^1 is the same or different and is phenyl, alkyl-substituted phenyl group containing from 7 to 18 carbon atoms and an alkyl group containing from 3 to 10 carbon atoms; and

iii. x is an integer selected from the group consisting of 1, 2, and 3.

3,929,654

ORTHO ALKYL PHENOL AND ORTHO ALKYL PHENOL SULPHIDE LUBRICATING OIL ADDITIVES

Phillip William Brewster, Wyoming, Canada; Peter Collen Hamblin, Cheadle, and James Pennycook Rutherford, Abingdon, both of England, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 417,121, Nov. 11, 1973. This application Claims priority, application United Kingdom, Sept. 7, 1973, 1980/73, May 23, 1974, 23068/74 Sept. 5, 1974, Ser. No. 503,370

Int. Cl.² C10M *1/38, 3/32, 5/28, 7/36*

U.S. Cl. 252—48.2 **16 Claims**

1. An additive mixture comprising

a. 45–75 wt.% of a phenol substituted with one or two hydrocarbyl groups, one of which must be in the ortho position,

b. 5–20 wt.% of a hydrocarbyl substituted phenol disulphide, each benzene ring having one or two hydrocarbyl substituents, one of which in each ring being in the ortho position with respect to the hydroxyl group and

c. 15–40 wt.% of a hydrocarbyl substituted phenol trisulphide, each benzene ring having one or two hydrocarbyl substituents, one of which in each ring being in the ortho position with respect to the hydroxyl group.

15. A lubricating oil composition comprising a major proportion by weight of a lubricating oil and a minor proportion by weight of the alkyl phenol additive mixture according to claim **1**.

3,929,655

ADDITIVES FOR HYDROCARBONACEOUS MATERIALS

Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 7, 1974, Ser. No. 521,981

Int. Cl.² C10M *1/32, 3/26, 5/20, 7/30*

U.S. Cl. 252—51.5 R **12 Claims**

1. A solid additive comprising a mixture of from about 1 to about 50 percent by weight of the reaction product of an epihalohydrin and a primary amine containing from 14 to 22 carbon atoms, and from about 50 to about 99 percent by weight of the reaction product of an epihalohydrin and an N-alkyl-1,3-diaminopropane containing from 14 to 22 carbon atoms in the alkyl chain.

2. The solid additive as set forth in claim **1** being added to a petroleum distillate.

3,929,656

DRAWING OIL

Klaus-Jurgen Flis, Bochum, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed July 26, 1974, Ser. No. 492,315

Claims priority, application Germany, Aug. 17, 1973, 2341577

Int. Cl.² C10M *1/00, 3/24, 5/18, 7/28*

U.S. Cl. 252—56 R **7 Claims**

1. A lubricating oil composition comprising from about 60 to 90 weight percent of a mineral oil having a viscosity of 50°C. in the range of about 250 to 600 centistokes, from about 5 to 30 weight percent of an additive from the class consisting of vegetable oils and from about 3 to 15 weight percent of a chlorinated paraffin containing greater than 40 up to 80 percent chlorine.

3,929,657

STOICHIOMETRIC FERRITE CARRIERS

Lewis O. Jones, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 5, 1973, Ser. No. 394,604

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.1 P **10 Claims**

1. An electrostatographic dry developer mixture for developing electrostatic latent images comprising finely-divided

toner particles electrostatically clinging to the surface of humidity-insensitive, uncoated electrostatographic carrier materials, said carrier materials comprising substantially stoichiometric ferrite compositions which are within ± 3 mol percent deviation from stoichiometry in divalent metal content.

3,929,658

MAGNETIC RECORDING COMPOSITIONS AND ELEMENTS OF LOW ABRASIVENESS AND PROCESS FOR MAKING THEM

Grant A. Beske, Princeton Junction, N.J., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 303,052, Nov. 2, 1972, abandoned. This application Dec. 2, 1974, Ser. No. 529,005

Int. Cl.² H01F *1/30*; G11B *5/62*

U.S. Cl. 252—62.54 4 Claims

1. In a magnetic recording composition comprising ferromagnetic particles having a mean particle length not greater than about 10 microns dispersed in an organic polymeric binder, the improvement wherein said composition further comprises from about 2 to about 20 percent, based upon the weight of said ferromagnetic particles, of finely divided particles of at least one nonferromagnetic metal oxide having a hardness of 5.5 or less on the Moh scale selected from the group consisting of amatase titanium dioxide, molybdenum trioxide, brucite, calamine, chromite, cuprite, emmonsite, hausmannite, tenorite and zincite and a particle size in the range of about 0.2 to about 5.0 microns.

3,929,659

CROSSLINKED RUBBER/RESIN BINDERS FOR CHROMIUM DIOXIDE RECORDING MEMBERS

Boynton Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 18, 1973, Ser. No. 370,713

Int. Cl.² H01F *1/113*, *1/28*

U.S. Cl. 252—62.54 23 Claims

1. In a magnetic recording composition of the type comprising a plurality of ferromagnetic chromium dioxide particles dispersed in a polymeric resin binder, the improvement wherein said binder is formed by the reaction of a polyol and a polyfunctional hydroxyl-reactive compound in the presence of a preformed elastomer and a preformed hard resin; said polyol being selected from the group consisting of linear or branched aliphatic diols and triols, polymeric carboxylic esters having a molecular weight greater than 200 and hydroxyl numbers in the range of 1 to 500, and addition polymers having available pendant reactive hydroxyl groups; said preformed elastomers being selected from the group consisting of natural rubber, butadiene/acrylonitrile copolymers; block copolymers of butadiene/styrene; polychloroprene; chlorosulfonated polyethylene; and preformed non-reactive polyether-polyurethanes and polyesterpolyurethanes; and said preformed hard resin being selected from the group consisting of epoxy and phenoxy resins, polycarbonates; polyesters; polyacrylic and polymethacrylic acids and esters thereof, cellulose ethers and esters, styrene polymers and copolymers, polyamides, vinyl polymers and copolymers, vinylidene polymers and copolymers, copolymers of two or more vinyl, vinylidene or acrylic monomers and mixtures thereof; the total binder composition comprising 1 to 25% by weight of polyol, 2.5 to 30% by weight of polyfunctional hydroxyl-reactive compounds, 10 to 60% by weight of preformed elastomers and 25 to 70% by weight of preformed hard resin.

3,929,660

ARC-EXTINGUISHING MATERIALS

Joseph M. Khalid, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed May 29, 1973, Ser. No. 364,596

Int. Cl.² H01B *3/02*

U.S. Cl. 252—63.2 9 Claims

1. An arc-extinguishing material consisting of a compound comprising a primary ingredient having arc-extinguishing properties, and a binder, said primary ingredient including an element having a first ionization potential no less than 7.54 electron volts and selected from a class consisting of silver, tantalum, copper, rhenium, tungsten, boron, palladium, tellurium, zinc and selenium, the relative proportions of said primary ingredient and said binder being a silicone resin, the carbon atoms of said total compound being no greater than fifteen percent of the total concentration of atoms thereof.

3,929,661

LIQUID DETERGENT BLEACHING COMPOSITION

Yunosuke Nakagawa, Koshigaya; Yoshiaki Inamoto, and Koji Aigami, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 531,226

Claims priority, application Japan, Dec. 11, 1973, 48-139338

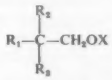
Int. Cl.² C11D *7/56*

U.S. Cl. 252—103 7 Claims

1. A liquid detergent bleaching composition, consisting essentially of a stabilized, alkaline, aqueous solution of

a. from 0.5 to 10 percent by weight of sodium hypochlorite,

b. from 0.1 to 20 percent by weight of surfactant having the formula



wherein R_1, R_2 and R_3, which can be the same or different, each is alkyl having 1 to 18 carbon atoms, the sum of the carbon atoms of R_1, R_2 and R_3 being from 10 to 20, and X is $-SO_3M$, $-CH_2COOM$, $-CH_2CH_2COOM$, $-(CH_2CH_2O)_nSO_3M$ or $-(CH_2CH_2O)_nCH_2COOM$, wherein n is an integer from 1 to 40 and M is an alkali metal

c. from 0.1 to 5 percent by weight of a water-soluble inorganic alkali effective for stabilizing said sodium hypochlorite in aqueous alkaline solution, and

d. the balance water.

3,929,662

LIQUID OR GAS PHASE STERILIZING AND CLEANING COMPOSITION CONTAINING AN ALDEHYDE AND A FLUORO OR PERFLUORO COMPOUND

Raymond Marcel Gut Boucher, New York, N.Y., assignor to Wave Energy Systems Inc., New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,881

Int. Cl.² C11D *3/48*

U.S. Cl. 252—106 7 Claims

1. A gas or liquid phase essentially non-aqueous composition for simultaneously cleaning and sterilizing of inanimate objects or animate surfaces consisting essentially of 0.005% to about 3% of at least one aldehyde selected from the group consisting of methanal, ethanedial, malonaldehyde, succinaldehyde, glutaraldehyde, adipaldehyde, heptanedial, octanedial, and iminodiacetaldehyde; and a fluoro or perfluoro chemical as active ingredients.

3,929,663

CONTROLLED FOAMING DETERGENT COMPOSITIONS

Haruhiko Arai, Narashino, and Yutaka Minegishi, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 206,498, Dec. 9, 1971, abandoned. This application Apr. 1, 1974, Ser. No. 456,824

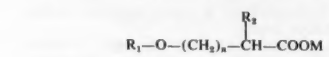
Int. Cl.² C11D *1/06*, *9/14*

U.S. Cl. 252—110 3 Claims

1. A controlled foaming detergent composition consisting essentially of

A. from 5 to 40 percent by weight of anionic surface active agent selected from the group consisting of alkylbenzenesulfonate salts having a straight or branched chain alkyl group of 10 to 18 carbon atoms, alkyl sulfuric ester salts of 12 to 18 carbon atoms, α-olefin sulfonic acid salts of 14 to 20 carbon atoms, alkane sulfonic acid salts of 12 to 20 carbon atoms, sulfuric ester salt of polyoxyethylene (1–10 oxyethylene units) alkyl ($C_{12} - C_{15}$) ether, sulfuric ester salt of polyoxyethylene (1–10 oxyethylene units) alkyl ($C_9 - C_{12}$) phenyl ether and mixtures thereof,

B. from 0.1 to 15 percent by weight of fatty acid salt or mixture of fatty acid salts of the formula:



wherein R_1 is an alkyl group of 10–24 carbon atoms, R_2 is an alkyl group of 1–8 carbon atoms and the total number of carbon atoms of R_1 and R_2 is 11-25, n is 0 or 1 and M is an alkali metal,

provided further that the amount of said fatty acid salt or mixture of fatty acid salts is from 1 to 40 percent by weight, based on the weight of said anionic surface active agent,

C. and the balance is builder selected from the group consisting of sodium tripolyphosphate, sodium sulfate, sodium carbonate, water-soluble sodium silicate, sodium borate, sodium nitrilotriacetate, sodium succinate, sodium salt of carboxymethylcellulose and polyethylene glycol and mixtures thereof.

3,929,664

WATER-WASHABLE INSPECTION PENETRANT EMPLOYING TRIGLYCERIDES AND POLYGLYCERIDES OF FATTY ACIDS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 482,465, June 24, 1974. This application Oct. 8, 1974, Ser. No. 513,084

Int. Cl.² C09K *11/06*; **G01N** *19/08, 21/16*

U.S. Cl. 252—301.2 P **1 Claim**

1. In a water-washable inspection penetrant process in which a water-dispersible dyed liquid penetrant is applied to test parts, surface penetrant is removed by washing said test parts with water, and said parts are inspected for residual entrapments of penetrant liquid in surface flaws, the improvement wherein said water-washable penetrant consists essentially of the following formulation, stated in weight percentages:

Low-solubility solvent liquid	30% to 99.8%
Indicator dye	.2% to 30%
Solvent coupler	zero to 40%

said low-solubility solvent liquid being at least one member selected from the group consisting of:

Cottonseed oil,
Palm kernel oil,
Peanut oil,
Coconut oil,
Linseed oil,
Olive oil,
Soybean oil,
Castor oil,
Sunflower seed oil,
Rape seed oil,
Safflower oil,
Lard,
Tallow,
Fish oil,
Sardine oil, and
Whale oil,

and said solvent coupler being at least one member selected from the group consisting of:

Methanol,
ethanol,
butanol,
isopropanol,
1-propanol,
2-butanol,
ethylene glycol monobutyl ether,
ethylene glycol monoethyl ether,
ethylene glycol monomethyl ether,
diethylene glycol monomethyl ether,
diethylene glycol monoethyl ether,
diethylene glycol monobutyl ether,
butoxytriglycol,
methoxytriglycol,
ethoxytriglycol, and
1-butoxyethoxy-2-propanol,

said low-solubility solvent liquids being selectively employed singly and in combination.

3,929,665

PROCESS FOR PREPARING LUMINESCENT MATERIALS BASED ON OXYSULPHIDES

Franco Gazzarrini; Paolo Aguzzi, both of Novara, Italy, and Adriana Corsini-Mena, Moscow, U.S.S.R., assignors to Montedison S.p.A., Milan, Italy

Filed May 29, 1974, Ser. No. 474,186

Claims priority, application Italy, May 30, 1973, 24827/73

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 S **4 Claims**

1. A process for preparing luminescent grade oxysulphides having the empirical formula $M'_{2-x}M''_xO_2S$, in which M′ is an element selected from the group consisting of yttrium, gadolinium and lanthanium; M″ is an element selected from the group consisting of europium, terbium, samarium, erbium, thulium, dysprosium, holmium, neodymium, and praseodymium, and x is a number from 0.0002 to 0.2; which process is characterized in that

a. an aqueous solution or suspension containing (1) element M′ in the form of an oxide, a nitrate, or a halide, (2) element M″ in the form of an oxide, a nitrate or a halide, (3) a sulphurizing agent in an amount of from 100% to 200% of the stoichiometric amount necessary to form oxysulphides having said formula and selected from the group consisting of thiourea, sodium thiosulphate, elementary sulphur, and mixtures thereof and a basic compound selected from the group consisting of alkaline or ammonium hydroxides and carbonates in amount such as to adjust the pH to a value of from 8 to 12; is subjected to a hydrothermal synthesis in an autoclave at 200°–350°C for from 3 to 5 hours and under a pressure of from 15 to 150 atm;

b. the solid product obtained at the conclusion of the hydrothermal synthesis is filtered and dried;

c. the dried solid product is mixed with a sulphurizing agent selected from the group consisting of alkaline thiosulphates, alkaline polysulphides and a mixture made up of 30 to 60% by weight of elementary sulphur and from 40 to 70% by weight of sodium carbonate to form a charge which is subjected to a heat-treatment at 900°C to 1100°C for from 30 minutes to 2 hours, said sulphurizing agent constituting from 10% to less than 40% by weight of said charge; and

d. the solid product obtained at the conclusion of the heat-treatment of (c) is reduced to pulp in water, filtered and dried.

3,929,666

PROCESS FOR PREPARING BASIC ALUMINUM SALT SOLUTION

Yoshikazu Aiba; Takaki Furumori; Shozo Shinpo, and Kaoru Funabiki, all of Kakogawa, Japan, assignors to Taki Fertilizer Manufacturing Co., Ltd., Japan

Filed Apr. 2, 1974, Ser. No. 457,344
Claims priority, application Japan, Apr. 19, 1973, 48-44475
Int. Cl.² C02B 1/20; C01F 7/74, 7/76
U.S. Cl. 252—317 11 Claims

1. A process for preparing a solution of the basic aluminum salt represented by the formula:

$$Al_m(OH)_nX_{3m-n-2k}(SO_4)_k$$

wherein X denotes Cl^- or NO_3^-, k, m and n are respective positive indices, $3m > n + 2k$, the basicity $((n/3m) \times 100)$ is 30 to 70% and $k/m = 0.01$ to 0.3, which solution is stable against precipitation, characterized by mixing a water-soluble sulfate or a solution containing SO_4^{--}, a solution containing Al^{+++} and X^- and a sodium or potassium aluminate solution at a temperature below 40°C to form a gel and then keeping the entire mixture at 50° to 80°C so that said gel is dissolved to give a basic aluminum salt solution.

3,929,667

IMMERSION OIL FORMULATIONS FOR USE IN MICROSCOPY AND SIMILAR FIELDS

Arthur N. Bautis, Lyndhurst, N.J., assignor to R. P. Cargille Laboratories, Inc., Cedar Grove, N.J.

Filed June 19, 1974, Ser. No. 480,630
Int. Cl.² G01N 21/60; G02B 1/06
U.S. Cl. 252—408 10 Claims

1. An immersion oil for use in the field of microscopy and related fields thereto, consisting essentially of a hydrogenated terphenyl in solution with at least one compound selected from the group consisting of polybutene derivatives and mineral oil to provide an index of refraction between the range of 1.5100 and 1.5240.

3,929,668

ZEOLITIC CATALYTIC CRACKING CATALYSTS

Gerald V. Nelson, Nederland; Douglas J. Youngblood, Groves, and James H. Colvert, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 717,968, April 1, 1968, abandoned. This application Apr. 27, 1970, Ser. No. 29,758
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 26 Claims

1. A process of increasing the catalytic cracking activity, selectivity and attrition resistance of a catalytic cracking catalyst comprising a zeolitic crystalline aluminosilicate in a siliceous matrix, said catalyst having been rendered catalytically active previously by a process comprising drying and calcining, which comprises heat treating said catalyst at a temperature above about 1300°F. and below the thermal destructive temperature of said zeolitic crystalline aluminosilicate contained therein in the absence of steam.

21. A process of preparing a catalytic cracking catalyst which comprises:

a. calcining a material comprising zeolitic crystalline aluminosilicate in a siliceous matrix at a temperature below about 1300°F. rendering said material catalytically active,
b. heating said material in the presence of steam at a temperature of 1000° to 1400°F., and
c. heating said material in the absence of steam at a temperature above about 1300°F. and below the thermal destruction temperature of said zeolitic crystalline aluminosilicate.

3,929,669

METHOD FOR MANUFACTURING AN ADSORBENT USEFUL FOR OLEFIN SEPARATION

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 22, 1972, Ser. No. 317,861
Int. Cl.² B01J 29/06; C10G 25/00
U.S. Cl. 252—455 Z 6 Claims

1. A method for the production of improved adsorbent particles comprising a sodium form X structured zeolite having increased adsorptive capacity for olefins and decreased catalytic activity from a precursor mass comprising an X structured zeolite and having a Na_2O/Al_2O_3 ratio less than about 0.7, which method comprises the steps of:

a. contacting said precursor mass with an aqueous sodium hydroxide solution at ion exchange conditions to increase the sodium cation content to a Na_2O/Al_2O_3 ratio of greater than about 0.7 and to remove from about 1 to about 15 wt. % of silica and alumina from the precursor mass;
b. washing said mass with water to remove therefrom excess sodium hydroxide; and,
c. at least partially dehydrating said mass at dehydrating conditions.

3,929,670

CATALYST

Tetsuichi Kudo, Tokyo; Tetsuo Gejyo, Tokyo; Kazuetsu Yoshida, Kokubunji, and Michiharu Seki, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 24, 1973, Ser. No. 391,244
Claims priority, application Japan, Aug. 25, 1972, 47-84543
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 R 19 Claims

1. A catalyst consisting essentially of a metal oxide composition represented by the general formula:

$$La_{2-x}A_xCu_{1-y}M_yO_4$$

wherein A is at least one element selected from the group consisting of lanthanides of an atomic number of from 59 to 71, yttrium and alkaline earth metals, B is at least one element selected from the group consisting of lithium, aluminum, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, zinc, gallium, zirconium, tin, molybdenum and tungsten, x is a number defined by $0 \leq x \leq 2$, and y is a number defined by $0<y<1$.

3,929,671

AUTO EXHAUST CONTROL CATALYST ON SILICA CLOTH SUPPORT

Harutoki Nakamura, Toyonaka, and Jun Yagi, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 165,094, July 23, 1971, abandoned. This application Dec. 5, 1973, Ser. No. 421,808
Claims priority, application Japan, July 30, 1970, 45-67149
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 R 3 Claims

1. A process for preparing a catalyst for purification of exhaust gas from automobiles, which comprises dealkalizing glass fiber cloth with sulfuric acid to a silica content of at least 91 wt. percent and an alkali content of not more than 0.1 wt. percent, heating the dealkalized glass fiber cloth at 500° to 1100°C, thereby recrystallizing surfaces of the cloth once through semi-melting, dipping the cloth in an aqueous or an aqueous alcoholic solution containing at least one of inorganic powders of γ-alumina, magnesia, silica, titania, and zirconia and at least one of salts of platinum, palladium, rhodium, ruthenium, cobalt, iron, nickel, copper, manganese and chromium as a catalytic material, drying the silica cloth at 40° to 120°C and calcining the same at 300° to 400°C for 30 minutes to 2 hours.

3,929,672

AMMONIA-STABLE Y ZEOLITE COMPOSITIONS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. Nos. 191,123, Oct. 20, 1971, abandoned, and Ser. No. 236,185, March 20, 1972, Pat. No. 3,781,199. This application Oct. 15, 1973, Ser. No. 406,684
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 32 Claims

1. A catalyst composition comprising a minor proportion of a hydrogenation component selected from the class consisting of the Group VIB and Group VIII metals and their oxides and sulfides intimately composited with a hydrothermally stable, ammonia-stable Y zeolite base, said Y zeolite base having been prepared by the steps of:

1 calcining an ammonium sodium Y zeolite containing about 0.6 – 5 weight-percent of sodium as Na_2O, said calcining being carried out at a temperature between about 600° and 1650°F in contact with at least about 0.2 psi of water vapor for a sufficient time to substantially reduce the unit cell size of said zeolite and bring it to a value between about 24.40 and 24.64 A;

2 subjecting the calcined zeolite to further ammonium ion exchange under conditions adjusted to replace at least about 25 percent of its residual zeolitic sodium ions with ammonium ions and produce a product containing less than about 1 weight-percent Na_2O;

3 consolidating the product from step (2) into granules having intimately admixed therein a finely divided hydrous oxide selected from the class consisting of alumina, silica, magnesia, titania, zirconia, thoria, beryllia, chromia, clays and mixtures thereof; and

4 calcining the granules at a temperature between about 600° and 1500°F for a time sufficient to effect substantial deammoniation, but insufficient to reduce the unit cell size of the zeolite to below about 24.40 A.

15. A hydrothermally stable, ammonia-stable Y zeolite composition prepared by the steps of:

1 calcining an ammonium-sodium Y zeolite containing about 0.6 – 5 weight-percent of sodium as Na_2O, said calcining being carried out at a temperature between about 600° and 1650°F in contact with at least about 0.2 psi of water vapor for a sufficient time to substantially reduce the unit cell size of said zeolite and bring it to a value between about 24.40 and 24.64 A; and

2 subjecting the calcined zeolite to further ammonium ion exchange under conditions adjusted to replace at least about 25 percent of its residual zeolitic sodium ions with ammonium ions and produce a final product containing less than about 1 weight-percent Na_2O.

3,929,673

METHOD OF PRODUCING A RANEY COPPER CATALYST AND THE CATALYST SO MADE

Karl H. Hoffmann, Brookfield; Donald R. Anderson, Oswego, both of Ill., and Ronald J. Allain, Brookhaven, Miss., assignors to Nalco Chemical Company, Chicago, Ill.

Filed June 28, 1974, Ser. No. 484,179
Int. Cl.² B01J 21/04, 23/72
U.S. Cl. 252—463 32 Claims

1. In an improved process for preparing a Raney copper catalyst comprising from about 2 to 45 weight percent aluminum with the balance up to 100 weight percent being copper, the improvement which comprises contacting particles of a metal alloy comprised of copper and aluminum with an aqueous solution which has dissolved therein on a 100 weight percent total by-product free solution basis from greater than 0 to about 25 weight percent alkali metal hydroxide and at least one soluble aliphatic polyhydric alcohol containing at least two carbon atoms, each said alcohol having a solubility in water of at least about 5 weight percent and having a molecular weight less than about 1000, said contacting being conducted at a temperature below about 80°C.

3,929,674

BORIDE-CONTAINING METALLIZATIONS

Frank Knowles Patterson, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 3, 1974, Ser. No. 476,032
Int. Cl.² H01B 1/02
U.S. Cl. 252—514 16 Claims

1. In metallizing compositions of a finely divided conductor powder selected from the class consisting of Pt, Pd, Au, Ag, and mixtures, alloys, and oxides thereof dispersed in an inert liquid vehicle, improved compositions additionally comprising finely divided aluminum boride; each of the aforesaid powders being sufficiently finely divided to pass through a 200-mesh screen; the aluminum boride being present in an amount equal to at least 0.05% of the weight of noble metal in the composition; the solids content of the composition being from 0.1–20 parts by weight of solids per part by weight of vehicle.

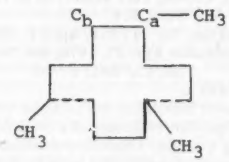
3,929,675

NOVEL PRODUCTS AND PROCESSES

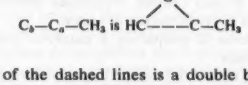
Seymour Lemberg, Elizabeth, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 638,429, May 15, 1967, Pat. No. 3,845,078, which is a continuation-in-part of Ser. No. 551,675, May 20, 1966, abandoned. This application Feb. 27, 1974, Ser. No. 446,141
Int. Cl.² A61K 7/46; C11B 9/00
U.S. Cl. 252—522 12 Claims

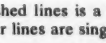
1. A perfume composition containing as an essential fragrance ingredient a 1,5,9-trimethylcyclododecatriene-1,5,9 derivative of the formula



wherein

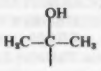


one or none of the dashed lines is a double bond, and the remaining dashed line or lines are single bonds;

or is 

and the dashed lines represent double bonds; or

$C_6-C_6-CH_3$ is



and the dashed lines represent single or double bonds, and at least one perfume additive selected from the group consisting of natural oils, synthetic oils, and fixatives.

3,929,676

BICYCLIC FRAGRANCE MATERIALS AND PROCESSES THEREFOR

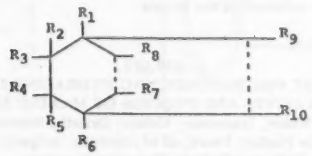
Robert L. Chappell, Morrestown, N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, and Manfred H. Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 494,034, Aug. 2, 1974, which is a continuation-in-part of Ser. No. 402,157, Oct. 1, 1973. This application Dec. 23, 1974, Ser. No. 535,561

Int. Cl.² A61K *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 **20 Claims**

1. A process for treating a perfume material which comprises adding thereto a small but effective amount of at least one bicyclo-[2.2.2]-octane derivative having the formula



wherein the dashed lines represent single or double carbon-to-carbon bonds; one of R_2 and R_3 is hydrogen or lower alkyl and the other is hydrogen or hydroxy, or taken together, R_2 and R_3 are a carbonyl oxygen; R_4 and R_5 are lower alkyl; R_1, R_6, R_7, and R_8 are hydrogen or lower alkyl; and one of R_9 and R_{10} is hydrogen, lower alkyl, cyano, lower carboalkoxy, or lower aliphatic acyl and the other is hydrogen, at least five of R_1 through R_{10} being other than hydrogen, to alter the organoleptic properties of the material.

3,929,677

PERFUME COMPOSITIONS AND PERFUME ARTICLES CONTAINING ONE ISOMER OF AN OCTAHYDROTETRAMETHYL ACETONAPHTHONE

John B. Hall, Rumson, and James Milton Sanders, Eatontown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 434,948, Jan. 21, 1974, which is a continuation-in-part of Ser. No. 336,172, Feb. 27, 1973, abandoned. This application Dec. 3, 1974, Ser. No. 529,086

Int. Cl.² A61K *2/46;* **C11B** *9/00*

U.S. Cl. 252—522 **8 Claims**

1. A process for altering the aroma properties of consumable material selected from the group consisting of perfume compositions and perfumed articles which comprises adding thereto a small but effective amount of an amber-like fragrance composition containing a major proportion of 1',2',3',4',5',6',7',8'-octahydro-2',3',8',8'-tetramethyl acetonaphthone isomers produced by a synthesis comprising the steps of:

i. Admixing at a temperature of from about 0°C up to about 50°C myrcene and 3-methyl-3-pentene-2-one in the presence of a Lewis acid catalyst thereby forming an acetyl substituted cyclohexane mixture, and

ii. Cyclizing the resulting acetyl substituted cyclohexane mixture with a cyclizing agent selected from the group consisting of concentrated phosphoric acid, sulfuric acid, boron trifluoride and complexes of boron trifluoride.

3,929,678

DETERGENT COMPOSITION HAVING ENHANCED PARTICULATE SOIL REMOVAL PERFORMANCE

Robert Gene Laughlin, and Vincent Paul Heuring, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

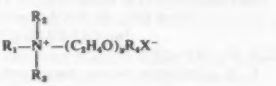
Filed Aug. 1, 1974, Ser. No. 493,953

Int. Cl.² C11D *3/066, 1/18*

U.S. Cl. 252—526 **29 Claims**

1. A detergent composition comprising

A. 1 to 99% by weight of the composition of a compound having a formula selected from the group consisting of

i) 

wherein

R_1 is selected from the group consisting of straight and branched chain C_6–C_{20} alkyl and alkenyl moieties and alkaryl moieties in which the alkyl group has 10–24 carbon atoms;

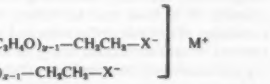
R_2 is selected from the group consisting of straight and branched chain C_6–C_{21} alkyl and alkenyl moieties, alkaryl moieties in which the alkyl group has 6–16 carbon atoms, and C_{1-4} alkyl and hydroxyalkyl moieties;

R_3 is selected from the group consisting of straight and branched chain C_6–C_{21} alkyl and alkenyl moieties, alkaryl moieties in which the alkyl group has 6–16 carbon atoms, C_{1-4} alkyl and hydroxyalkyl moieties and $-(C_2H_4O)_xH$ wherein x has a value of about 3 to about 50;

R_4 is selected from the group consisting of C_1–C_8 alkylene, C_3–C_8 alkenylene, 2-hydroxy propylene, 2- and 3-hydroxy butylene moieties and C_1–C_4 alkarylene moieties provided that where R_3 is $-(C_2H_4O)_xH$ then R_4 is $-CH_2-CH_2-$;

X^- is an anion selected from the group consisting of sulfate and sulfonate radicals; and

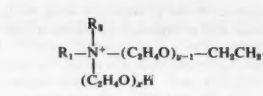
y has a value in the range of 2–100 provided that where R_3 is $-(C_2H_4O)_xH$ then $x+y \geq 10$; and

ii) 

wherein R_1 is selected from the group consisting of linear and branched C_6–C_{20} alkyl and alkenyl radicals; R_2 is selected from the group consisting of linear and branched C_6–C_{20} alkyl and alkenyl radicals and C_1–C_4 alkyl and hydroxyalkyl radicals; X^- is selected from the group consisting of sulfate and sulfonate; y and x have values in the range of 2–100 provided that $y+x \geq 12$; M is a cation selected from the group consisting of alkali metal, ammonium and alkanolammonium ions; and

B. 99 to 1% by weight of the composition of an organic detergent.

3. A detergent composition according to claim **1** wherein the zwitterionic compound has the formula:



wherein R_1 is selected from the group consisting of straight and branched chain C_{16}–C_{22} alkyl and alkenyl moieties, R_2 is a C_1–C_3 alkyl group and $x + y$ has a value in the range of 14–50.

3,929,679

PARTICULATE SILICATE-HYDROXYALKYL IMINODIACETATE BUILT DETERGENT COMPOSITIONS OF IMPROVED PROPERTIES

Francis R. Cala, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,185

Int. Cl.² C11D *3/066*

U.S. Cl. 252—527 **14 Claims**

1. A particulate heavy duty synthetic organic detergent composition which comprises 5 to 30 parts of anionic detergent and/or 1 to 10 parts of nonionic detergent and, as a builder therefor, 15 to 50 parts of a water-soluble salt of a hydroxy C_3–C_4 alkyl iminodi C_2–C_4 carboxylic acid hydrated by 3 to 10 moles of water per mole of iminodicarboxylate.

3,929,680

LIQUID DETERGENT COMPOSITION

Haruhiko Arai, Narashino; Kyozaburo Tachibana, Sakura; Yoshinori Naganuma, Tokyo, and Moriyasu Murata, Narashino, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1973, Ser. No. 352,053

Claims priority, application Japan, Apr. 20, 1972, 47-039886

Int. Cl.² C11D *3/18, 3/43, 3/44, 17/08*

U.S. Cl. 252—542 **4 Claims**

1. A liquid detergent composition having improved low temperature stability, consisting essentially of an aqueous solution of at least one surfactant selected from the group consisting of anionic surfactants and non-ionic surfactants, the amount of said surfactant being an amount effective for making said detergent composition suitable for washing foodstuffs, tableware or clothes, or as a shampoo; a first solubilizing agent selected from the group consisting of alkanols having one to 3 carbon atoms; benzene sulfonates, p-toluene sulfonates, xylene sulfonates, acetyl benzene sulfonates, glycols, acetamides, pyridine dicarboxylic acid amides, benzoates, salicylates and urea; and a second solubilizing agent selected from the group consisting of hexyl benzene, octyl benzene, nonyl benzene, dodecyl benzene and tetradecyl benzene, said liquid detergent composition containing from about 3 to about 30 percent by weight, based on the weight of said surfactant, of said second solubilizing agent, the weight ratio of said second solubilizing agent to said first solubilizing agent being from 1/40 to 2/1, whereby to improve the low temperature stability of the liquid detergent composition.

3,929,681

CATALYTIC COMPOSITIONS USEFUL FOR THE OXIDATION OF CARBON MONOXIDE AND HYDROCARBONS AND THE PROCESS FOR PREPARING THEM

Franco Buonomo; Vittorio Fattore; Gianfranco Zanoni, and Bruno Notari, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese

Filed Sept. 1, 1972, Ser. No. 285,652

Claims priority, application Italy, Sept. 2, 1971, 28155/71; July 18, 1972, 27097/72

Int. Cl.² B01J *23/72, 23/84, 23/86*

U.S. Cl. 252—465 **13 Claims**

1. Supported catalytic composition adapted to catalyze the oxidation of carbon monoxide and hydrocarbons contained in the exhaust gases of an internal combustion engine, comprising:

a. a carrier constituted by gamma-alumina having a spheroidal shape, high porosity between 0.5 and 1.0 cc/g, a high specific area between 150 and 350 m^2/g, high mechanical resistance and low mass specific gravity; and

b. an active part constituted by a catalytic composition selected from the group consisting of members represented by the formulae:

$Cu\ Ni_{1.4}Cr_2O[_{6.9}]w$;

$Cu\ Mn\ Cr_2O[_{7.5}]w$; and

$Cu\ Mn_{1.2}Co_{1.4}{}^{0}[4.5–14]w$.

wherein w is the index for the quantity of oxygen required to satisfy the valences of the metals.

3,929,682

CATALYST FOR DECOMPOSING HYDRAZINE AND ITS DERIVATIVES AND PROCESS OF MAKING SAME

Winfried Kuhrt, Hannover; Helmut Derleth, Nienburg, and Hermann Fischer, Evern, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Aug. 14, 1974, Ser. No. 497,251

Claims priority, application Germany, Aug. 16, 1973, 2341363

Int. Cl.² B01J *21/04, 23/56*

U.S. Cl. 252—466 PT **19 Claims**

1. A process for producing a catalyst for decomposing hydrazine and its derivatives, comprising the steps of impregnating particles of active aluminum oxide at least four times with an aqueous solution comprising a noble metal salt selected from the group consisting of an aqueous solution of an iridium salt, an aqueous solution of a mixture of an iridium salt and an osmium salt, and alternating aqueous solution of an iridium salt and an aqueous solution of an osmium salt, drying said impregnated product after each of said impregnation steps, and subjecting said dried product at least after each second drying step to reducing conditions in the presence of a stream of hydrogen gas at a temperature between about 180° and about 400°C, whereby said noble metal salt is reduced to the corresponding noble metal.

3,929,683

METHOD OF MANUFACTURING A PLATINUM-TIN REFORMING CATALYST

George J. Antos, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 7, 1974, Ser. No. 521,979

Int. Cl.² B01J *21/04, 23/62*

U.S. Cl. 252—466 PT **13 Claims**

1. A method of catalyst manufacture which comprises:

a. solubilizing a tin salt in an aluminum hydroxyhalide hydrosol;

b. effecting gelation of the tin-containing hydrosol;

c. drying and calcining the tin-containing gelation product;

d. impregnating the calcined product with an aqueous solution of a thermally decomposable platinum group metal compound;

e. drying and calcining the impregnated material in an oxygen-containing atmosphere, and heating the same at conditions to remove adsorbed oxygen;
f. commingling the resulting composite with a solution of a trialkyl aluminum compound; and
g. drying and treating the dried composite in a hydrogen atmosphere at a temperature of from about 425° to about 650° C.

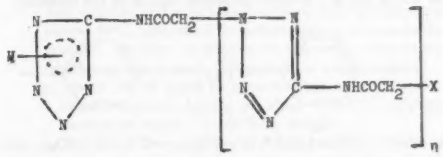
3,929,684

NEW ADHESIVE TETRAZOLE POLYMERS AND PROCESS OF MAKING THEREFOR

Fred J. Einberg, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 21, 1974, Ser. No. 435,345
Int. Cl.² C08G 73/06
U.S. Cl. 260—2 R 8 Claims

1. Tetrazole polymers of the formula



where X is a member selected from the group consisting of Br, Cl, and I, and η is an integer such that the inherent viscosity of said tetrazole polymers at 25°C is a number from about 0.05–0.11.

3,929,685

PROCESS FOR PRODUCING CASTING MOLDS SUITABLE FOR USE IN THE CERAMIC INDUSTRY

Bruno Jung, Bleiholle 76, CH 4242 Laufen, Switzerland

Continuation-in-part of Ser. No. 211,646, Dec. 23, 1971, abandoned. This application June 11, 1973, Ser. No. 368,919
Int. Cl.² C08J 9/24
U.S. Cl. 260—2.5 HB 19 Claims

1. A process for producing casting molds suitable for use in the ceramic industry, said process comprising the steps of:
a. forming a castable mixture of an emulsion and a major amount of at least one polymer component,
b. said polymer component being in the form of a powder composed of spherical particles and having a polymerization catalyst uniformly distributed over the entire surface of said particles,
c. said emulsion comprising at most 20% by weight of water based on said castable mixture, a surface active agent capable of maintaining said emulsion, and a polymerizable compound comprising at least one water insoluble liquid monomeric or only partially polymerized compound polymerizable to form a rigid polymer and capable of being slightly imbibed by said polymer powder as the oil phase,
d. casting said castable mixture to form a casting mold,
e. polymerizing said polymerizable compound, and
f. removing the water from the pores of the mold thus produced.

3,929,686

POLYISOBUTYLENE NUCLEATING AGENTS FOR EXPANDABLE STYRENE POLYMER COMPOSITIONS

John L. Stevenson, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Aug. 31, 1973, Ser. No. 393,454
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 B 14 Claims

1. A composition suitable for the preparation of an expanded, cellular polymeric product, comprising a styrene polymer, a blowing agent for said styrene polymer and from about 0.02 to 0.15% by weight based upon said styrene polymer of a low molecular weight, liquid isobutylene polymer nucleating agent.

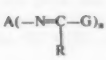
3,929,687

MULLTICELLULAR POLYMERS MADE FROM THE REACTION PRODUCT OF MALEIC ANHYDRIDE WITH A POLYIMINE

Max Gruffaz, La Mulatiere, and Bernard Rollet, Lyon, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Apr. 23, 1974, Ser. No. 463,248
Claims priority, application France, Apr. 26, 1973, 73.15176
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 EP 11 Claims

1. Process for preparing a multicellular material which comprises curing a liquid polymer selected from a 1,2-epoxy resin, a phenol-aldehyde resin, an unsaturated polyester and a polymeric reaction product of an unsaturated polyamine with a polyimine in the presence of a reaction product of maleic anhydride with a polyamine of the general formula:



(I)

in which *n* represents a number at least equal to 2, G represents a monovalent organic radical containing less than 35 carbon atoms, R is as defined under G or represents a hydrogen atom, or G and R together form a divalent hydrocarbon radical, and A represents an organic radical of valency *n* containing 2 to 50 carbon atoms.

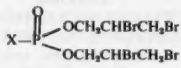
3,929,688

BIS(2,3-DIBROMOPROPYL)PHOSPHATE AS A FLAME RETARDANT FOR POLYMERS

Milton L. Honig, New York, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 242,146, April 7, 1972, and a continuation-in-part of Ser. No. 145,553, May 20, 1971, abandoned. This application Apr. 25, 1974, Ser. No. 463,949
Int. Cl.² C08K 5/53
U.S. Cl. 260—2.5 AJ 8 Claims

1. A flame retardant composition comprising an intimate admixture of a polymeric substrate and an effective concentration of a bis(2,3-dibromopropyl) phosphonate corresponding to the formula:



where X is a radical selected from the group consisting of phenyl and Y—CH_2— radicals wherein Y is a halo radical selected from the group consisting of chloro and bromo radicals.

8. The composition of claim **1**, wherein said bis(2,3-dibromopropyl) phosphonate is bis(2,3-dibromopropyl) phenylphosphonate.

3,929,689

FOAMED FLAME RETARDANT POLYOLEFIN COMPOSITIONS OF IMPROVED PHYSICAL STRENGTH

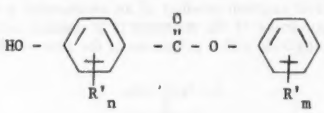
Roger J. Walton, and Kenneth R. Mills, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 246,202, April 21, 1972, abandoned. This application July 5, 1974, Ser. No. 486,174

Int. Cl.² C08J *9/04;* **C08K** *5/09*

U.S. Cl. 260—2.5 HA **21 Claims**

1. A foamed flame retardant polyolefin composition comprising a polyolefin selected from homopolymers derived from the polymerization of 1-monoolefins having from 3 to 8 carbon atoms, and copolymers derived from the polymerization of 1-monoolefins having from 3 to 8 carbon atoms with a minor amount of at least one 1-monoolefin having from 2 to 8 carbon atoms; an effective flame retardant amount of a halogenated organic compound; and an effective stabilizing amount of a phenylbenzoate stabilizer having the formula:



wherein each R′ is the same or different and independently represents halogen or an aliphatic, alicyclic, aromatic hydrocarbyl or hydrocarbyloxy radical, *n* is an integer of from 0 to 4, and *m* is an integer of from 0 to 5.

3,929,690

PHOTODEGRADABLE STYRENE POLYMER FOAMS CONTAINING CONJUGATED KETO STEROIDS

Harold A. Wright, Murrysville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Nov. 29, 1974, Ser. No. 528,063

Int. Cl.² C08J *9/20*

U.S. Cl. 260—2.5 HB **18 Claims**

1. A process for making expandable styrene polymer particles containing a photosensitizer comprising suspending styrene polymer particles with the aid of a suspending system in water containing a blowing agent and a photosensitizer, heating the suspension at a temperature from about 80° to 150°C. to impregnate the polymer particles, and separating the impregnated particles from the water; said photosensitizer being present in an amount of 0.5–5.0 parts by weight per 100 parts by weight of said polymer particles and being selected from the group consisting of those steroids having a 3-keto-group combined with an ethylenic unsaturation conjugated therewith.

3,929,691

SOLUTIONS OF COPOLYMERS CONTAINING AMIDE AND IMIDE GROUPS AND PROCESS FOR THEIR PREPARATION

Pierre Allard, Cailloux-sur-Fontaines, France, assignor to Societe Rhodiaceta, Paris, France

Filed Dec. 29, 1969, Ser. No. 888,913

Claims priority, application France, Dec. 30, 1968, 68.181,948

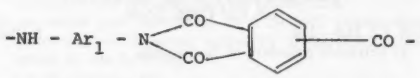
Int. Cl.² C08G *73/14*

U.S. Cl. 260—30.2 **10 Claims**

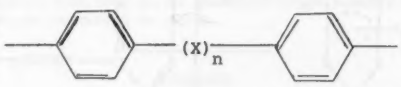
1. A spinnable solution consisting essentially of a high molecular weight polyamide-polyimide copolymer dissolved in a polar solvent, said copolymer consisting essentially of units of the formulae:

$$-NH-Ar_1-NH-CO-Ar_2-CO-$$

and



in which Ar_1 is a divalent aromatic radical of the formula:



in which *n* is 0 or 1 and X is —CH_2—, —O—, or —SO_2—, and Ar_2 is a divalent aromatic radical, said polar solvent being essentially anhydrous and essentially inert with respect to said copolymer, and said copolymer having an inherent viscosity between 0.5 and 1.6, as measured by using an 0.5% strength solution thereof in N-methylpyrrolidone at 25°C.

3,929,692

SPRAYABLE DECORATIVE COATING COMPOSITION FOR COVERING UNFINISHED SURFACES

Sidney Offerman, Great Neck, N.Y., assignor to Grow Chemical Corporation, New York, N.Y.

Filed Mar. 6, 1973, Ser. No. 338,601

Int. Cl. C08g *39/10*

U.S. Cl. 260—7.5 **6 Claims**

1. A sprayable decorative coating composition for imparting flame retardant and/or acoustical properties to building interior wall surfaces consisting essentially of, on a 100 gallon basis, a liquid medium, a synthetic fibrous material suspended in the liquid medium containing a film-forming substance, a mineral agent and hydroxy ethyl cellulose, wherein the fibrous material is present in an amount of at least 2 pounds and is selected from the group consisting of a polyamide and a polyester; the liquid medium is selected from the group consisting of water, phenols, alkyd resin, diethylene glycol, monoethyl ether acetate, ethylene glycol, aliphatic or aromatic liquid hydrocarbons, and oleoresin; the film-forming substance is selected from the group consisting of polyvinyl alcohol, acrylic resin, polyvinyl acetate, casein, butadiene styrene mixtures, and soya protein, and the mineral agent is selected from the group consisting of mica, calcium silicate, pearlite, calcium carbonate, and magnesium silicate.

3,929,693

FILM-FORMING COMPOSITIONS COMPRISING DISPERSIONS OF CELLULOSE ACETATE BUTYRATE OR POLYMETHYLMETHACRYLATE COMBINED WITH RUBBERY PARTICLES OF CROSSLINKED POLYACRYLATES IN LIQUID CARRER

Seymore Hochberg, Wynnewood, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 883,279, Aug. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 671,594, Sept. 29, 1967, abandoned. This application Feb. 12, 1973, Ser. No. 331,869

Int. Cl.[2] C08L *51/00, 31/02, 1/14*

U.S. Cl. 260—17 R **2 Claims**

1. A dispersion comprising

1. cellulose acetate butyrate or a poly(alkyl methacrylate) having 1–8 carbon atoms in the alkyl radical, wherein said polymer has a weight average molecular weight from 50,000 to 10 million and a Knoop hardness value of at least 5;

2. a polymeric composition prepared by

A. providing, as a first portion, substantially spherical monomolecular particles of a polymer each of which has sites of free radical attack, wherein said particles have an average diameter of about 60–20,000 millimicrons, a weight average molecular weight of at least 100 million, and which are rubbery at a temperature below 60°C, prepared by polymerizing, in a suitable reaction medium, a mixture of reactive components which contain in each 100 parts of a weight thereof

x. about 75–99 parts of a monoethylenically unsaturated monomer having an alkyl (C1–C8) acrylate content of about 75–100% by weight,

y. about 0.5–24 parts of allyl methacrylate,

and

z. about 1–15 parts of a cross-linking agent, other than allyl methacrylate, having at least two polymerizable double bonds per molecule,

and

B. grafting to each of the particles at said sites a second portion composed of a poly(alkylmethacrylate) of 1–8 carbon atoms in the alkyl group, wherein said second portion has a weight average molecular weight of 1,000–150,000, and

3. a liquid carrier.

3,929,694

CLEAR ADHESIVE APPLICATOR CRAYON COMPRISING AGAR AND POLYACRYLAMIDE

Peter Spiros Columbus, Whitestone, N.Y., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 447,153, March 1, 1974, which is a continuation-in-part of Ser. No. 348,357, April 5, 1973. This application Oct. 10, 1974, Ser. No. 513,684

Int. Cl. C08d *9/06*

U.S. Cl. 260—17.4 ST **12 Claims**

1. A solid adhesive applicator crayon comprising from about 0.5 to about 5.0 parts of agar, about 60 to 95 parts of water and about 0.5 to 36.0 parts of polyacrylamide having a molecular weight of from about 50,000 to 10,000,000.

3,929,695

PHENOLIC RESIN ADHESIVES CONTAINING RESORCINOL, FORMALDEHYDE AND AN ALKALI METAL CARBONATE

Takao Murata; Nobutaka Nakamura, and Yukio Saeki, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1973, Ser. No. 327,512

Int. Cl.[2] C08G *8/22*

U.S. Cl. 260—17.5 **6 Claims**

1. An adhesive composition comprising in admixture:

1. a water-soluble thermosetting phenolic resin which consists essentially of a condensation product of a monohydroxy-phenol and an aldehyde in a mole ratio of phenol to aldehyde of about 1:1.5 to 1:3, and

2. a curing agent consisting essentially of resorcinol, a formaldehyde donor and an alkali metal carbonate, wherein said formaldehyde donor is in a proportion of about 1 to 10 parts by weight per 100 parts of said phenolic resin, said resorcinol is in proportion of about 1 to 5 parts by weight per 100 parts of said phenolic resin, and said alkali metal carbonate is in a proportion of about 1 to 5 parts by weight per 100 parts of said phenolic resin.

3,929,696

CONTINUOUS PROCESS FOR THE PRODUCTION OF AMINOPLAST MOULDING COMPOSITIONS

Ugo Nistri, Como; Antonio Parodi, and Silvio Vargiu, both of Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed June 17, 1974, Ser. No. 480,445

Claims priority, application Italy, June 15, 1973, 25411/73

Int. Cl.[2] C08L *1/02*

U.S. Cl. 260—17.3 **6 Claims**

1. A continuous process for the production of aminoplast moulding compositions, which comprises

continuously impregnating cellulose material with a syrup of an aminoplast resin, values of about 4:1 to about 50:1 being maintained for weight ratio between said syrup and the said cellulose material;

continuously eliminating the excess of resin to obtain a quantity of cellulose material of from about 15 to about 50 parts by weight per 100 parts by weight of resin in the impregnated material;

continuously homogenizing said impregnated material with the appropriate additives, and then subjecting the resulting mixture to drying and granulation.

3,929,697

DYE COMPOSITION AND METHOD OF DYEING

Elliott Morrill, and James E. Miller, both of Indianapolis, Ind., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 19, 1973, Ser. No. 408,012

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.4 ST **17 Claims**

1. An aqueous dye composition having a pH of from about 1.0 to about 9.0 comprising in combination (a) about 0.01–10% of a water insoluble pigment, (b) about 0.01–10% of a cationic starch and (c) about 0.01–5% of a nonionic, anionic or zwitterionic dispersant.

3,929,698

POLYMERIZABLE POLYMER COMPOSITIONS

Alan George Hudson, Maidstone, and John Leonard Orpwood, West Kingsdown, both of England, assignors to Coates Brothers & Company Limited, London, England

Continuation-in-part of Ser. No. 417,812, Nov. 21, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,542
Claims priority, application United Kingdom, Dec. 1, 1972, 55598/72
Int. Cl.² C09D *3/52, 3/66, 5/25*
U.S. Cl. 260—22 CB 5 Claims

1. A process for the preparation of a polymerizable composition which comprises reacting, in one or more stages and in the presence of a polymerzation inhibitor, (A) acrylamide or methacrylamide; (B) at least 1.5 moles of formaldehyde per mole of acrylamide or methacrylamide; (C) from 0.95 to 1 mole (*x* mole), per mole of acrylamide or methacrylamide, of an organic hydroxyl group-containing component comprising one or more organic hydroxyl group-containing compounds containing one primary or secondary aliphatic hydroxyl group per molecule as sole chemical functional group; and (D) *k-x* moles (wherein *k* is the number of moles of formaldehyde used ignoring any excess over two) of one or more polyesters having primary and/or secondary hydroxyl groups alone or a mixture of said polyester or polyesters with one or more hydroxyl group-containing compounds containing from 1 to 4 primary or secondary hydroxyl groups per molecule.

3,929,699

FOG RESISTANT POLYMER COMPOSITIONS

William F. Bernholz, Wayne, N.J., assignor to PVO International Inc., San Francisco, Calif.

Filed Jan. 29, 1970, Ser. No. 6,968
Int. Cl.² C08K *5/06, 5/10*
U.S. Cl. 260—23 XA 15 Claims

1. A film-forming composition comprising a homogeneous mixture of a polyvinyl polymer selected from the group consisting of polyvinyl chloride homopolymers and vinyl chloride-vinyl acetate copolymers, and an effective amount of an anti-fog composition to impart resistance to moisture fogging, said anti-fog composition comprising the two components:

A. a partial ester of a water soluble C_{2-6} polyol with a C_{8-18} aliphatic monocarboxylic acid, and

B. an alkoxylated alkylphenol.

3,929,700

POLYVINYL CHLORIDE COMPOSITION

Axel W. Tybus, New York, and Leonard A. Fabrizio, North Bellmore, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Apr. 29, 1974, Ser. No. 465,403
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23 XA 20 Claims

1. A polyvinyl chloride composition which is formable at temperatures above about 129–130° F and is a shape-retaining solid at ambient temperatures comprising

100 parts by weight of polyvinyl chloride,

about 7.5 to 8.5 parts of a polyvinyl chloride plasticizer,

about 10 to 14 parts of an impact-modifier selected from the group consisting of methylmethacrylate-butadiene-styrene polymer and an acrylonitrile-butadiene-sytrene polymer,

about 1.5 to 2.1 parts of a polyvinyl chloride processing aid,

about 1¼ to 2 parts of at least one polyvinyl chloride lubricant,

about 0.8 to 1.1 parts of at least one polyvinyl chloride stabilizer, and

about 5 to 8 parts of at least one polyvinyl chloride stabilizer booster containing polyvinyl alcohol.

3,929,701

BINDERS FOR PRINTING INKS

Claude E. Hall, Alma, and Louis L. Stalvey, Baxley, both of Ga., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 16, 1974, Ser. No. 506,484
Int. Cl.² C08L *91/00*
U.S. Cl. 260—23 ST 9 Claims

1. A binder for water base flexographic or gravure inks comprising a major amount of an ester of a copolymer of an ethylenically unsaturated alcohol and a styrene monomer; said esterified copolymer being a copolymer of:

a. an ethylenically unsaturated alcohol selected from the group consisting of allyl alcohol, methallyl alcohol and mixtures thereof, and

b. styrene monomer selected from the group consisting of styrene, alpha- and beta-substituted styrene, mono- and di-alkyl, chloro and chloroalkyl styrene and mixtures thereof; wherein said copolymer before esterification has a hydroxyl group content of from about 4–7.5 percent by weight;

from 50 to 85 percent of said hydroxyl groups being esterified with

c. a rosin material, and

from 1 to 10 percent of said hydroxyl groups being esterified with

d. a modified drying oil;

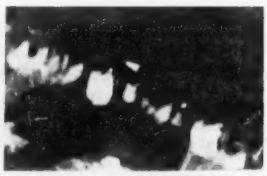
said binder having an acid number of from 70 to 225 and a melting point of from about 115° to 160°C.

3,929,702

PLATABLE POLYPROPYLENE COMPOSITION

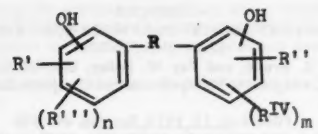
Robert W. Miller, Mentor, and Samuel Garry Howell, Painesville, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 13,042, Feb. 20, 1970. This application Jan. 22, 1971, Ser. No. 108,764
Int. Cl.² C08L *93/00*
U.S. Cl. 260—27 R 3 Claims



1. A novel composition of matter comprising a polymer selected from the group consisting of polypropylene homopolymers and copolymers of propylene and other alpha-olefins wherein at least 80 percent of the monomer units are propylene; said polymer having incorporated therein:

A. from about 0.1 to about 10.0 parts by weight per 100 parts by weight of polymer of a polyhydroxy aromatic compound selected from the group consisting of resorcinol, alkyl substituted gamma-resorcylic acids, aryl substituted gamma-resorcylic acids, aralkyl substituted gamma-resorcylic acids, and compounds within the scope of the formula:



wherein R is a member selected from the group consisting of sulfur atoms, sulfur containing radicals, and methylene radicals; wherein R', R'', R''', and R^{IV} may be the same or different, and each is a member selected from the group consisting of alkyl radicals having less than 15 carbon atoms; and wherein *n* and *m* are integers which may be the same or different, and each may be 0, 1, 2, or 3;

B. from about 0.25 to about 20.0 parts by weight per 100 parts by weight of polymer of a rosinous material, said rosinous material being a member selected from the group consisting of natural rosins, wood rosin esters, polymeric rosinous materials, hydrogenated wood rosins, polyterpene resins, and mixtures of at least two of said members;

C. from about 0.01 to about 5.0 parts by weight per 100 parts by weight of polymer of a nucleating agent.

3,929,703

ADHESIVE COMPOSITIONS CONTAINING ZINC RESINATES OF DISPROPORTIONATED ROSIN

Henry P. Weymann, Acadia Parish, La., and John Korose, Gulf Breeze, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation of Ser. No. 280,340, Aug. 14, 1972, which is a division of Ser. No. 154,590, June 18, 1971, abandoned. This application May 16, 1974, Ser. No. 470,462

Int. Cl.² C08K *93/00*

U.S. Cl. 260—27 BB **10 Claims**

1. An adhesive composition that comprises a polymeric material selected from the group consisting of natural rubber, polyethylene, ethylene-vinyl acetate copolymers, polychloroprene, butadiene-acrylonitrile polymers, block polymers of styrene with butadiene, block polymers of styrene with isoprene, and mixtures thereof and 25 percent to 400 percent, based on the weight of said polymeric material, of a zinc resinate of disproportionated rosin, said resinate being the product prepared by (a) forming a mixture that consists of 100 parts by weight of disproportionated rosin that has a Ball and Ring Softening Point in the range of about 40°C. to 75°C., 10 to 17 parts by weight of zinc oxide, and 0 to 4 parts by weight of hydrated lime and (b) heating said mixture at a temperature in the range of about 50°C. to 100°C. to form a resinate having a calculated acid number in the range of 0 to −70.

3,929,704

SILICONE PRESSURE SENSITIVE ADHESIVES AND TAPES

Albert Emerson Horning, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 7, 1973, Ser. No. 367,960

Int. Cl.² C08K *5/01, 5/12, 5/54;* **C08L** *83/04*

U.S. Cl. 260—29.1 SB **20 Claims**

1. A pressure-sensitive adhesive composition comprising a silicone resin, a silicone gum and a catalytic amount of a curing agent therefor, said curing agent comprising from about 10 to about 90% by weight of 2,4-dichlorobenzoyl peroxide, from about 2 to about 30% by weight of a plasticizer therefor, said plasticizer being a high boiling ester of low volatility, and for the balance an extender therefor, said extender comprising an alkylaryl or an alkylaralkyl siloxane fluid containing at least about 3% of aryl-silicon or aralkyl-silicon bonds out of the total carbon-silicon linkages.

3,929,705

PRESERVATIVES FOR SURFACE-COATING COMPOSITIONS

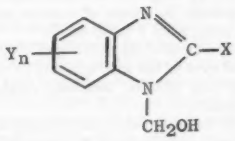
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Mar. 6, 1974, Ser. No. 448,734

Int. Cl.² C09D *5/14*

U.S. Cl. 260—29.6 MN **12 Claims**

1. A surface-coating composition having improved resistance to attack by fungi and bacteria that comprises (a) a water-insoluble, film-forming, resinous binder selected from the group consisting of oleoresinous binders, synthetic linear addition polymers obtained by the vinyl polymerization of ethylenically-unsaturated molecules, and mixtures thereof and (b) about 0.10 percent to 3 percent, based on the weight of said composition, of a biocidal compound having the structural formula



wherein X represents hydrogen, alkyl of 1 to 4 carbon atoms, hydroxymethyl, or hydroxymethylthio; Y represents nitro or halogen; and *n* represents a number in the range of 0 and 2.

3,929,706

CONTINUOUS PROCESS FOR THE PRODUCTION OF COPOLYMER DISPERSIONS

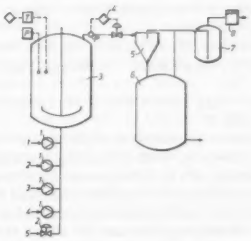
Adolf Schmidt, Cologne; Herbert Bartl, Odenthal-Hahnenberg, and Heinrich Meckbach, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 22, 1974, Ser. No. 444,753

Claims priority, application Germany, Feb. 24, 1973, 2309368

Int. Cl.² C08L *23/08*

U.S. Cl. 260—29.6 TA **9 Claims**



1. A continuous process for producing an aqueous film-forming dispersion having a solids content of from 45 to 60% by weight wherein a mixture consisting of

10 to 30% by weight of ethylene,

20 to 89% by weight of vinyl chloride;

0 to 69% by weight of vinyl acetate and

1 to 6% by weight of at least one hydrophilic monomer containing at least one $—SO_3Me$, $—O—SO_3Me$, —COOMe or $—CONH_2$ group attached thereto through a carbon atom wherein Me is H, Na, K or NH_4,

is copolymerized in an aqueous dispersion in at least one reactor at a pH of from 3.5 to 8.5, at a temperature of from 40° to 80°C and under a pressure of from 50 to 200 atmospheres, the copolymerization of the monomers being carried out with intimate mixing in the presence of

a. 0.5 to 2.5% by weight of at least one anionic emulsifier, based on the quantity of water introduced per unit of time;

b. 0.05 to 1.5% by weight of at least one protective colloid, based on the quantity of water introduced per unit of time and

c. 0.1 to 2.5% by weight of at least one radical-forming initiator selected from the group consisting of (i) a water soluble peroxide and (ii) a redox system containing a water soluble peroxide and a water soluble reducing agent, based on the quantity of water introduced per unit of time, said temperature being from 60° to 80°C. when (i) is the radical-forming initiator and from 40 up to 70°C. when (ii) is the initiator and the ratio by weight of said peroxide compound to said reducing agent in (ii) being adjusted so that there is from 0.025 to 0.05% by weight of said peroxide compound in finished dispersion and

d. the average residence time, defined as the ratio between the quantity by weight of reaction mixture in the reactor and the quantity by weight of reaction mixture removed per hour being from 2 to 30 hours;

e. the ratio by weight of the quantity of ethylene introduced per unit of time to the total quantity of monomers introduced per unit of time, including ethylene being from 0.1:1 to 0.65:1;

f. the ratio by weight of the total quantity of vinyl chloride and vinyl acetate introduced per unit of time to the total quantity of water introduced per unit of time being from 0.5:1 to 1.5:1 and

g. the ratio of volume of dispersion in the reactor to total reactor volume being from 0.5:1 to 0.99:1.

3,929,707

PROCESS FOR THE PRODUCTION OF POURABLE, PULVERULENT RUBBER-FILLER MIXTURES

Gerhard Berg, and Karl-Heinz Nordsiek, both of Marl, Germany, assignors to Chemische Werke Hules Aktiengesellschaft, Marl, Germany

Filed June 27, 1974, Ser. No. 483,709

Claims priority, application Germany, June 28, 1973, 2332796

Int. Cl.² C08J *3/20;* **C08K** *5/01;* **C08L** *9/04*

U.S. Cl. 260—29.7 T **22 Claims**

1. In a process for preparing discrete, finely divided, tack-free, pourable, powdery, filler-containing elastomer particles from an admixture of (a) an aqueous elastomer emulsion comprising (i) a solution of elastomer dissolved in a volatile, inert organic solvent having a boiling point below 100°C, (ii) an elastomer emulsifying amount of about 0.05–2.0% by weight, based on the elastomer solution, of an alkylamine oxyalkylate surfactant, and (iii) water; and (b) an aqueous suspension or dispersion of a solid, finely divided elastomer filler, which comprises gradually introducing said admixture into an aqueous alkali silicate solution containing 2–20 moles of SiO_2 per mole of said alkylamine oxyalkylate while maintaining said silicate solution at an acidic pH of 0.1–7 and simultaneously evaporating said volatile organic solvent to form said filler-containing elastomer particles, the improvement which comprises:

employing said admixture of (a) and (b) in the form of a stable aqueous emulsion containing an emulsion-stabilizing amount of about 0.001–0.5% by weight, based on the elastomer solution, of an ionic, water soluble protective colloid, said stable emulsion having an alkaline pH of 7–14.

3,929,708

ARYLENE SULFIDE POLYMERS COMPRISING SILICONE FLUIDS

Donnie G. Brady, and Fay W. Bailey, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 15, 1974, Ser. No. 497,620

Int. Cl.² C08J *5/00;* **C08K** *5/54;* **C08L** *81/04*

U.S. Cl. 260—29.1 SB **8 Claims**

1. A composition of matter comprising at least one (poly-(arylene sulfide) resin having a melt point in the approximate range of 400° to 800°F, and a melt flow in the approximate range of 0.1 to 3,000, and from about 0.05 to about 5 weight percent of a thermally stable silicone fluid, based on the combined weight of said resin and said fluid, wherein said silicone fluid is a polysiloxane having a molecular weight in the approximate range of 500 to 3,000 and having the repeating units

wherein each R is a monovalent hydrocarbon radical having up to 6 carbon atoms individually selected from the group consisting of alkyl, cycloalkyl and aryl.

3,929,709

NON-ELASTOMERIC POLYURETHANE COMPOSITIONS CONTAINING CYCLIC ETHERS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 425,398, Dec. 7, 1973, Pat. No. 3,879,329, which is a continuation-in-part of Ser. No. 366,835, June 4, 1973, Pat. No. 3,878,157, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 13, 1974, Ser. No. 532,553

Int. Cl.² C08K *5/15*

U.S. Cl. 260—30.4 N **9 Claims**

1. A process for producing solid, rigid, polyurethane articles having a density of at least 1 g/cc, a percent elongation of less than 30, and which can be demolded within a period of about 5 minutes without the addition of an external source of heat which process comprises:

1. admixing the components of a composition comprising

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of cyclic polyethers and mixtures thereof, said polyethers being cyclic tetramers and above of ethylene oxide, propylene oxide, butylene oxide or epichlorohydrin, and

D. a non-amine-containing catalyst for urethane formation, which is an organo metal compound;

wherein Components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, Component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when Component (B) is an NCO-containing prepolymer containing less than about 40% NCO by weight, Component (C) is present in quantities of from about 10% to about 50% by weight of the sum of Components (A), (B), and (C); and Component (D) is present in quantities of from about 0.2 to about 10 percent by weight of the sum of the weights of Components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition;

2. placing the admixed composition into a suitable mold wherein said composition solidifies within less than about 5 minutes to a solid having the aforesaid density and elongation; and
3. subsequently demolding the resultant article from the mold.

3,929,710

POLYMER COMPOSITIONS

Eric Nield, Watton-at-Stone, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 357,573, May 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 207,975, Dec. 14, 1971, abandoned, which is a continuation-n-part of Ser. No. 118,191, Feb. 23, 1971, abandoned. This application Apr. 30, 1974, Ser. No. 465,556

Claims priority, application United Kingdom, Feb. 23, 1970, 8477/70; Nov. 10, 1970, 53346/70

Int. Cl.² C08K 5/42

U.S. Cl. 260—30.8 R 14 Claims

1. A composition having improved processability comprising from 92 to 9990 by weight of a thermoplastic polymer containing 66.7% to 95% molar of units of acrylonitrile which is a copolymer and/or a superstrate of a graft copolymer having a diene rubber substrate, the amount of acrylonitrile present being calculated independently of any diene rubber which may be present, and 8% to 1% by weight of at least one processing aid selected from the group consisting of diphenyl sulphone and bis-(4-chlorophenyl) sulphone, the processing aid being a liquid at the temperature employed during the processing.

3,929,711

DICYCLOHEXADIENE TETRAACYL COMPOUNDS

Steven A. Cereffice, Naperville, and Ellis K. Fields, River Forest, both of Ill., assignors to The Standard Oil Company, Chicago, Ill.

Filed Oct. 12, 1973, Ser. No. 405,837

Int. Cl.² C08K 5/12; C08L 27/06

U.S. Cl. 260—31.8 B 5 Claims

1. A composition comprising a resinous polymer of vinyl chloride containing at least 50 mol percent vinyl chloride units and from 5 to 300 parts by weight of a tetra ester of dicylohexadiene tetracarboxylic acid per 100 parts by weight resinous polymer of vinyl chloride, wherein the ester moieties of said tetra ester are selected from at least one member of the class consisting of alkyl groups containing from 1 to 24 carbon atoms, aryl groups containing from 6 to 24 carbon atoms, aralkyl groups containing from 7 to 24 carbon atoms and alkenyl esters containing from 3 to 24 carbon atoms.

3,929,712

VINYL CHLORIDE TYPE RESIN COMPOSITION CONTAINING A LUBRICANT

Osamu Hiyama, and Kazuo Ito, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,038

Claims priority, application Japan, July 24, 1973, 48-83312

Int. Cl.² B29F 3/00; C08K 5/11; C08L 27/06

U.S. Cl. 260—31.8 B 6 Claims

1. A vinyl chloride resin composition having incorporated therein, as lubricant, from 0.05 to 2.0 parts by weight, per 100 parts of vinyl chloride resin, of a dialkyl citrate in which the two alkyl groups contain a total of 26 to 44 carbon atoms and each alkyl group contains from 12 to 22 carbon atoms, said vinyl chloride resin being selected from the group consisting of polyvinyl chloride, copolymers containing at least 50 weight percent of vinyl chloride units and the balance is units of one or more monomers copolymerizable with vinyl chloride, and polymer blends containing at least 80 weight percent of polyvinyl chloride and the balance being another polymer compatible with polyvinyl chloride.

3,929,713

POLYMERIZING BIS-MALEIMIDES AND POLYIMIDES THEREFROM

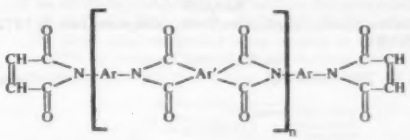
Gaetano F. D'Alelio, South Bend, Ind., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 363,799, May 25, 1973. This application Aug. 14, 1974, Ser. No. 497,492

Int. Cl.² C08G 73/10, 73/12

U.S. Cl. 260—32.6 23 Claims

1. A process of B-staging a bis-maleimide of the formula:



wherein

Ar is a divalent aromatic organic radical,

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical, and

n is 0 or a positive integer of 1 to 20, in a solvent which is inert to the bis-maleimide by passing oxygen or an oxygen-containing inert gas through the solution at a temperature from about 100°C. to about the boiling point of the solvent.

3,929,714

POLYESTER RESINS

Karl Schmidt, Hofweg 45; Ferdinand Hansch, Kalenbarg 23; Hans-Malte Rombrecht, Overbeckstrasse 3, and Hans-Joachim Beck, Am Langenzug 7, all of Hamburg, Germany

Division of Ser. No. 659,234, Aug. 8, 1967, Pat. No. 3,697,471, which is a continuation of Ser. No. 238,315, Nov. 2, 1962, abandoned. This application Oct. 2, 1972, Ser. No. 293,880

Claims priority, application Germany, Nov. 2, 1961, 64660; Dec. 12, 1961, 65130; July 6, 1962, 67934

Int. Cl.² C08G 73/16; C08K 5/01, 5/13; C08L 79/08

U.S. Cl. 260—33.4 P 6 Claims

1. A lacquer comprising a polyester imide resin dissolved in an organic medium containing as an essential component thereof a cresol type solvent, said polyester imide resin having ester groups of acid and alcohol moieties which are condensation products of at least difunctional carboxylic acid and at least difunctional alcohol, and, between said moeities, moieties containing a 5-membered imide ring and which are condensation products of 1 mol of trimellitic acid anhydride and 1 mol of primary aromatic amino carboxylic acid or primary aromatic amino alcohol, said moieties containing a 5-membered imide ring being present in an amount effective to improve the thermal stability of the resin without rendering the resin insoluble to an extent which would make it unsuitable for use in a wire lacquer composed of the resin dissolved in cresol and solvent naphtha.

4. A lacquer comprising a polyester imide resin dissolved in an organic medium containing as an essential component thereof a cresol type solvent, said polyester imide resin having ester groups of acid and alcohol moieties which are condensation products of at least difunctional carboxylic acid and at least difunctional alcohol, and, between said moieties, moieties containing a 5-membered imide ring and which are condensation products of 1 mol of tetracarboxylic acid anhydride and 2 mols of primary aromatic amino carboxylic acid or primary aromatic amino alcohol, said moieties containing a 5 -membered imide ring being present in an amount effective to improve the thermal stability of the resin without rendering the resin insoluble to an extent which would make it unsuitable for use in a wire lacquer composed of the resin dissolved in cresol and solvent naphtha.

3,929,715

AN OIL-BASED EDPM POLYMER COMPOSITION IN THE FORM OF A CASTABLE JELLY AND METHOD OF USING SAME

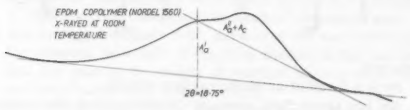
Roger Nowell, and Philip Edward Russell Tate, both of Swindon, England, assignors to Burmah Oil Trading Limited, Swindon, England

Continuation-in-part of Ser. No. 514,748, Oct. 15, 1974, abandoned, which is a continuation of Ser. No. 367,173, June 5, 1973, abandoned. This application Dec. 6, 1974, Ser. No. 530,609

Claims priority, application United Kingdom, June 8, 1972, 26852/72

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 AQ **11 Claims**



1. An oil-based composition in the form of a castable jelly comprising a substantially homogeneous blend of from 85 to 95 percent by weight of a mineral oil extender and from 5 to 15 percent by weight of a thermoelastic copolymer of ethylene, propylene and a diene monomer having an ethylene content between 60 and 90 percent by weight, a propylene content between 10 and 35 percent by weight and having a crystallinity of at least 12 percent.

3,929,716

EPOXY RESIN COMPOSITIONS

Hiroshi Komoto, Tsurugashima, and Kaoru Ohmura, Asaka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1973, Ser. No. 363,674

Claims priority, application Japan, June 5, 1972, 47-55141

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08L *63/02*

U.S. Cl. 260—37 EP **15 Claims**

1. An epoxy resin composition comprising:

I. 100 parts by weight of an epoxy resin having at least two epoxy groups in the molecule; and

II. 1–200 parts by weight of 1,3,6-triaminomethyl hexane or the reaction product thereof with an adduct forming compound selected from the group consisting of

a. a diepoxide or a glycidyl epoxy resin in up to about 0.5 times the molar amount of the triaminomethyl hexane, and

b. a monoepoxide or a vinyl compound in about 1 to 4 times the molar amount of the triaminomethyl hexane.

3,929,717

ALCOHOL SENSITIVE REPAIRABLE EPOXY EMBEDDING MATERIAL

S. Yen Lee, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,037

Int. Cl.² C08L *63/00*

U.S. Cl. 260—37 EP **5 Claims**

1. An epoxy embedding composition which is useful for potting of electrical and electronic components and which is easily removable therefrom for purposes of repair of the components, which comprises:

the combination of diglycidyl ether of a dihydroxyphenol, a diglycidyl ether of a polyoxyalkylene glycol, a polyoxyalkylenediamine, a primary or secondary alkyl, alkanol or aryl amine and, a filler, polyvinylpyrolidone wherein the polyvinylpyrrolidone filler is present in an amount of 10 to 100 parts by weight per 10 to 90 parts by weight diglycidyl either of dihydroxyphenol, 90 to 10 parts by weight of diglycidyl ether of polyoxyalkylene glycol and 1 to 5 parts by weight of said primary or secondary alkyl, alkanol or aryl amine.

3,929,718

ORGANOPOLYSILOXANE ELASTOMERS ADMIXED WITH FILLERS SUBJECTED TO MECHANICAL STRESS

Gunter Kratel; Jorg Patzke, and Karl-Heinrich Wegehaupt, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 16, 1974, Ser. No. 497,973

Claims priority, application Germany, Aug. 30, 1973, 2343846

Int. Cl.² C08L *83/04*

U.S. Cl. 260—37 SB **7 Claims**

1. An organopolysiloxane composition capable of being vulcanized to an elastomer containing a diorganopolysiloxane having a viscosity of at least 10^8 cSt at 25°C. in which the organic groups are selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, an agent capable of forming free radicals selected from the class consisting of peroxides, azo compounds and high energy radiation and a filler in which at least a portion of said filler is finely divided silicon dioxide particles having a surface area of at least 50 m^2/g. which have been subjected to mechanical stress and reacted with an organosilicon compound to increase the bulk weight of the silicon dioxide to a range of from about 120 to about 500 grams per liter, said organosilicon compound having the formula $(R_3Si)_aZ'$, wherein R is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, Z′ is selected from the class consisting of hydrogen, halogen, OH, OR′, NR′X, ONR'_2, SR′, OOCR′, O, N(CX) and S, wherein R′ is selected from the class consisting of alkyl radicals and aryl radicals, X is selected from the class consisting of hydrogen and R′ and *a* is 1 or 2.

3,929,719

PROCESS FOR THE BULK-DYEING OF LINEAR POLYESTERS

Andre Pugin, Riehen; Kurt Burdeska, Basel, and Jost von der Crone, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

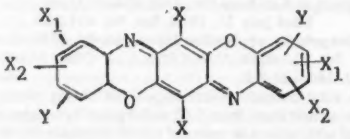
Filed Nov. 8, 1973, Ser. No. 414,018

Claims priority, application Switzerland, Nov. 10, 1972, 16399/72

Int. Cl.² C08K *5/29*

U.S. Cl. 260—40 P **11 Claims**

1. Process for bulk-dyeing linear polyesters, characterised in that mixtures containing at least 2 dyestuffs of the formula



wherein the X denote chlorine or bromine atoms or alkyl, alkoxy, aralkoxy, alkylmercapto, aralkylmercapto, arylmercapto, alkoxycarbonyl or aroyl groups, the Y denote hydrogen atoms or etherified hydroxyl groups, the X_1 denote hydrogen or halogen atoms, etherified hydroxyl groups or trifluoromethyl, aroyl, alkylsulphonyl, phenyl or phenylmercapto groups and the X_2 denote hydrogen or halogen atoms, or wherein the X_1 and X_2 form fused benzene rings, are used.

3,929,720

FLAME RESISTANT COMPOSITION OF MATTER OF HIGH MOLECULAR WEIGHT LINEAR POLYESTERS

Friedrich-Karl Rosendahl; Herbert Pelousek, both of Dormagen, and Hans Niederprüm, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

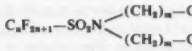
Filed Apr. 19, 1974, Ser. No. 462,497

Claims priority, application Germany, Apr. 19, 1973, 2320007

Int. Cl.² C08K 5/42; C08L 67/02

U.S. Cl. 260—40 P 7 Claims

1. A flame-resistant composition of matter having an LOI Index of at least 32 comprising a high molecular weight linear polyester and at least one compound of the general formula



wherein

n represents an integer of from 1 to 10 and

m represents an integer of from 2 to 10.

3,929,721

PROCESS FOR REDUCING FILLER LOSS IN TETRAFLUOROETHYLENE POLYMER PARTICLES

Glenn Frederick Leverett, Vienna, W. Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 473,159, May 26, 1974, abandoned. This application Dec. 11, 1974, Ser. No. 531,482

Int. Cl.² C08K 3/08, 9/06; C08L 83/04

U.S. Cl. 260—42.15 11 Claims

1. In the process for preparing filled agglomerated granules of non-melt-fabricable granular tetrafluoroethylene polymer in which the filler is particulate glass, bronze, or a mixture thereof present in an amount of between about 5% and 40% by volume of the total volume, by agitating a finely-divided blend of said granular tetrafluoroethylene polymer and said filler in which the particle size of the finely-divided tetrafluoroethylene polymer averages numerically below about 200 microns and in which the filler is present in an amount between about 5% and 40% by volume, in a two-phase liquid medium consisting essentially of water and an organic liquid which is soluble in water up to at most 15% by weight at the operating temperature of the process and which has a surface tension no greater than about 40 dynes/cm. at 25°C., and in which the organic liquid is present in an amount of 0.1 to 0.5 cc per gram of said blend, said liquid medium containing said blend having between about 5 to 30% by weight solids content, the improvement wherein said liquid medium contains a silicon compound which is either an amino-functional organosilane present in an amount of between 0.01 and 5 parts per 1000 parts by weight of water or a silicone resin soluble in said organic liquid present in an amount of between 0.5 and 30 parts per 1000 parts by weight of said finely-divided blend.

3,929,722

SELF EXTINGUISHING HIGH IMPACT RESISTANT POLYMERIC POLYBLEND

Bruce S. Bak, Longmeadow; Gary L. Deets, Springfield, and Francis J. Pokigo, Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 8, 1972, Ser. No. 232,913

Int. Cl.² C08K 3/18; C08L 9/02, 9/06

U.S. Cl. 260—42.47 16 Claims

1. A self-extinguishing high impact strength polymeric polyblend composition comprising:

A. about 37 to 69.5% by weight of a polymer of at least one monovinylidene aromatic monomer and an ethylenically unsaturated nitrile monomer wherein said ethylenically unsaturated nitrile monomer moiety constitutes from 0% to about 90% by weight of the said polymer uniformly blended with,

B. a crosslinked chloroprene rubber, said rubber being present in the polyblend in from about 15–40% by weight,

C. a diene rubber, said diene rubber being present in the polyblend in from about 0.5–8.0% by weight, said diene rubber being grafted with:

1. at least one monovinylidene aromatic monomer, and
2. an ethylenically unsaturated nitrile monomer wherein said ethylenically unsaturated nitrile monomer moiety constitutes from 0% to about 90% by weight of the total monomers grafted, and

D. an inorganic compound selected from the group consisting of Sb_2O_3, Bi_2O_3, MoO_3, SnO_2, WO_3, and mixtures of the same, said compound being present in from about 1–15% by weight of the polyblend, the total weight percentage of the polyblend being 100%.

3,929,723

PHOTODEGRADABLE POLYOLEFINS CONTAINING SULFENYL HALIDES

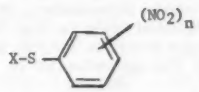
Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,706

Int. Cl.² C08K 5/36

U.S. Cl. 260—45.7 S 5 Claims

1. A composition comprising a polyolefin and about from 0.1 to 10% of an additive of the structure -



wherein:

X is chlorine, bromine or iodine

n is 1 or 2.

3,929,724

METHOD OF MANUFACTURING A POLYETHYLENE COMPOSITION CONTAINING AN AGING INHIBITOR

Hirokazu Miyauchi, and Hironaga Matsubara, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 126,949, March 22, 1971, abandoned. This application July 13, 1973, Ser. No. 379,103

Int. Cl.² C08L 23/08

U.S. Cl. 260—45.9 R 5 Claims

1. A method of manufacturing a polyethylene compound comprising the steps of preparing a master batch by compounding 100 weight parts of ethylene-vinyl acetate copolymer containing 10 – 35 weight-% vinyl acetate and 1 – 20 weight parts of at least one aging inhibitor, at a temperature at least equal to the melting point of the selected aging inhibitor, and thereafter compounding the master batch with ordinary low density polyethylene and a crosslinking agent in a quantity such that the final mixture contains no more than one part of said aging inhibitor per each one hundred parts resin and an average quantity of vinyl acetate of no more than five weight per cent of the resin.

3,929,725

PROCESS FOR STABILIZING POLYAMIDES

John M. Davis, Signal Mountain, Tenn., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,394

Int. Cl.² C08G 6/00

U.S. Cl. 260—45.75 C 10 Claims

1. A process for producing polyamides resistant to deterioration that is caused by heat and oxygen comprising incorporating into a polyamide-forming salt solution, cupric nitrate, an inorganic halide, and a hypophosphorous compound and then polymerizing the salt to form the polymer.

3,929,726

COLOR STABILIZED POLYURETHANES

Charles S. Schollenberger, Hudson; Kornelius Dinbergs, Broadview Heights, and Philip C. Kelley, Brecksville, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 6, 1974, Ser. No. 503,801
Int. Cl.² C08G 6/00
U.S. Cl. 260—45.85 B 4 Claims

1. A stabilized polyurethane containing about 0.1 to about 5 weight parts of benzoic acid hydrazide per 100 weight parts of polyurethane.

3,929,727

STABILIZED ETHYLENE-CARBON MONOXIDE COPOLYMERS

Donald Henry Russell, Cherry Hill, N.J., and Robert Warren Lenton, Glenolden, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 18, 1975, Ser. No. 588,071
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.95 F 3 Claims

1. A stabilized ethylene carbon monoxide copolymer composition containing about 0.1 to 20 percent based on the weight of polymer in the composition of 2,2′-dihydroxy-4-methoxybenzophenone.

3,929,728

PROCESS FOR PREPARING LINEAR POLYESTERS

Kazuya Chimura; Kazuo Ito; Shunichi Takashima; Mizuo Shindo, and Yoshihiro Shimoshinbara, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Continuation-in-part of Ser. No. 139,959, May 3, 1971, Pat. No. 3,822,239. This application Oct. 19, 1973, Ser. No. 407,987
Claims priority, application Japan, June 2, 1970, 45-46918; June 3, 1970, 45-47871; June 3, 1970, 45-47872; June 9, 1970, 45-49710; June 11, 1970, 45-50613; June 11, 1970, 45-50614; June 30, 1970, 45-57029; Oct. 20, 1970, 45-92294; Oct. 21, 1970, 45-92642. The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.
Int. Cl.² C08G 63/14
U.S. Cl. 260—75 R 18 Claims

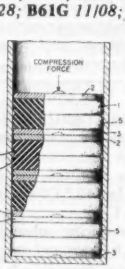
1. A process for preparing linear polyesters comprising condensing glycol terephthalate by incorporating into the polycondensation system an antimonycontaining polycondensation catalyst which is soluble in the polycondensation system and at least one member selected from the group consisting of (1) α-hydroxycarboxylic acid having 2 to 30 carbon atoms: (2) α,β-dicarboxylic acid having 4 to 30 carbon atoms; and (3ester, amide, acid anhydride, mixed acid anhydride or acid halide, of said α,β-dicarboxylic acid;

3,929,729

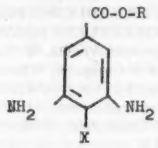
POLYUREAURETHANE SHOCK ABSORBING UNIT

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

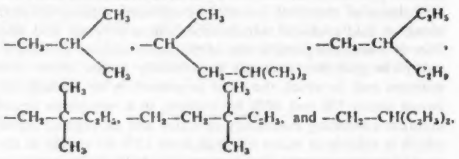
Filed Nov. 21, 1974, Ser. No. 525,790
Int. Cl.² C08G 8/28; B61G 11/08; F16F 7/12, 1/36
U.S. Cl. 260—75 NH 12 Claims



1. Shock absorbing unit which comprises a shaped resilient polyureaurethane composition characterized by (A) withstanding compressive cycling for at least about 500 cycles under constant compression alternating between a maximum of about 45 to about 55 percent and a minimum of about 8 to about 12 percent of its original uncompressed height, (B) requiring at least about 4200 pounds per square inch to compress said unit 55 percent of its original uncompressed height after 500 cycles of said compressive cycling, and (C) deflecting from about 0.3 to about 0.6 inch, preferably from about 0.4 to about 0.5 inch, at about 25°C upon the application of about 1800 pounds per square inch uniformly to the end surface areas of the said resilient compositions in its uncompressed state when the said composition is a generally disc-shaped cylindrical element with circular parallel end surfaces, said surfaces covered and adhered to circular steel plates, having a diameter of about 1.5 inches and a sidewall connecting the end surfaces substantially in the form of a V-shaped groove having substantially equal length sides, the said groove extending between the said end surfaces, the volume of said element being between 150 percent of the volume of the said groove, where said resilient shock absorbing polyureaurethane composition is prepared by the method which comprises reacting a diamine selected from 2,2′-diaminodiphenyldisulfide, 2,5-dichloro-1,3-phenylene diamine and a substituted diamine of the formula



where R is selected from alkyl radicals selected from methyl, ethyl, n-propyl, n-butyl, isopropyl, isobutyl, n-pentyl, isopentyl, hexyl, heptyl, octyl and decyl radicals, branched chain radicals selected from



aryl radicals selected from tolyl, phenyl and halophenyl radicals, aralkyl radicals selected from benzyl and α-alkyl benzyl radicals, where the alkyl group has 1 to 6 carbon atoms, and cycloalkyl radicals selected from cyclopentyl, cyclohexyl, 4-t-butylcyclohexyl and cycloheptyl radicals, and X is a chlorine radical, with the reaction product of (A) a diisocyanate selected from 1,5-naphthalene diisocyanate when the diamine is selected from 2,2′-diaminodiphenyldisulfide or a diisocyanate selected from 1,5-naphthalene diisocyanate, 3,3′-bitolylene-4,4′-diisocyanate and 3,3′-dimethyldiphenylenemethane-4,4′-diisocyanate when the diamine is selected from said substituted diamine and 2,5-dichloro-1,3-phenylene diamine, and (B) a mixture of at least one polymeric polyol with a total average molecular weight of about 1500 to about 2100 which comprises (1) polyols having a molecular weight of about 1800 to about 2200 selected from (a) about 65 to about 100 weight percent of a polyether polyol or (b) about 65 to about 100 weight percent of a polyol mixture comprising (i) about 35 to about 65 weight percent polyether polyol and (ii) about 65 to about 35 weight percent polyester polyol or (c) about 65 to about 95 weight percent of said polyether polyol-polyester polyol mixture and correspondingly (2) about 35 to about zero or 5 weight percent of at least one of a polyether polyol and polyester polyol having a molecular weight of about 800 to about 1250, wherein said polyether polyol is selected from polytetramethylene ether glycol and polypropylene ether glycol, and said polyester polyol is selected from (i) caprolactone polyesters prepared from caprolactones con-

taining 6 to 8 carbon atoms and glycols containing 4 to 7 carbon atoms and (ii) azelates of azelaic acid and glycols containing 4 to 7 carbon atoms, where the ratio of isocyanato groups to the sum of hydroxyl groups of the polyols is about 1.7 to about 2.5, where the ratio of primary amino groups of the diamine to excess isocyanato groups over the sum of said hydroxyl groups is about 0.6 to about 1.1 and where the acid number of the polyols is less than about 1.

3,929,730

PROCESS FOR PREPARING POLYURETHANES EMPLOYING A MIXTURE OF BUTANEDIOL AND PHENYLENE DIETHANOLAMINE AS A CHAIN EXTENDER

Peter U. Graefe, Brick Town; Vincent J. Gajewski, Jackson, and Ismael A. Jimenez, Farmingdale, all of N.J., assignors to Inter-Polymer Research Corporation, Farmingdale, N.J.

Filed Dec. 28, 1973, Ser. No. 429,284

Int. Cl.² C08G *18/32*

U.S. Cl. 260—77.5 AN **3 Claims**

1. A process for preparing polyurethane compositions which comprises reacting in the absence of any appreciable amount of dispersing agent:

a. at least one polyoxypropylene glycol of about 2,000 molecular weight, poly(epsilon-caprolactone)polyester glycol of about 2,000 molecular weight or mixture thereof;

b. a polyisocyanate, or a quasi-prepolymer prepared from the reaction of a poly(epsilon-caprolactone)polyester glycol of about 2,000 molecular weight with an excess amount of polyisocyanate sufficient to provide an average ratio of NCO groups to hydroxyl groups greater than about 2:1;

c. a mixture of polyfunctional chain extenders comprising butanediol and a sufficient amount of phenylenediethanolamine to render the mixture soluble in the polyol, the butanediol being present in the polyol at a level exceeding the maximum solubility of the butanediol at ambient temperature in the absence of phenylenediethanolamine and

d. a catalyst for the polyurethane reaction.

3,929,731

PROCESS FOR THE PRODUCTION OF POLYMERIC ACETALS CONTAINING URETHANE, CARBAMIDE AND AMIDE GROUPS

Leman Mustafa Kyzy Volkova, Noginsky raion, p/o Chernogolovka, ulitsa Pervaya, 15, kv. 7; Gennady Vladimirovich Korolev, Noginsky raion, p/o Chernogolovka, ulitsa Vtoraya, 3, kv. 1, both of Moskovskaya oblast; Fedor Ivanovich Dubovitsky, Vorobievskoe shosse, 2b, kv. 12, Moscow; Irina Ivanovna Trostyanskaya, Solnechny pereulok, 4, kv. 5, Gatchina Leningradskoi oblasti; Leonid Yakovlevich Rappoport, Grazhdansky prospekt, 105, korpus 4, kv. 57; Gennady Nikolaevich Petrov, Zheleznodorozhny pereulok, 7, kv. 35, both of Leningrad; Mikhail Fedorovich Shestakovsky, prospekt Mira, 49, kv. 108, Moscow; Renat Dovletovich Yakubov, ulitsa Dimitrova, 81, kv. 14, and Sergei Mikhailovich Maximov, ulitsa Gertsena, 9, kv. 6, both of Temirtau Karagandinskoi oblasti, all of U.S.S.R.

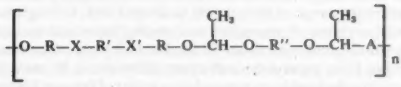
Filed June 27, 1974, Ser. No. 483,712

Claims priority, application U.S.S.R., June 28, 1973, 1929172

Int. Cl.² C08G *12/20*, *12/22*

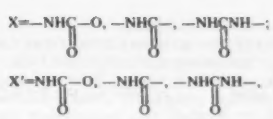
U.S. Cl. 260—77.5 B **29 Claims**

1. Polymeric acetals of the formula:



where

R is an alkylene with 1 to 6 carbon atoms;

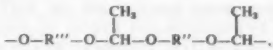


or is absent;

R′ is an alkylene with 1 to 10 carbon atoms, an arylene, a biarylene, or is absent;

R″ is an alkylene with 1 to 6 carbon atoms, an oxaalkylone with 1 to 8 carbon atoms, a cycloalkylene, an arylene, or a biarylene;

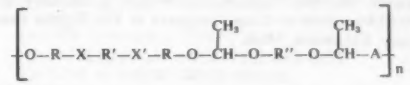
A has the formula:



where R‴ is a chain of polymeric diol having OH end-groups with a molecular weight of from 500 to 5,000, or is absent;

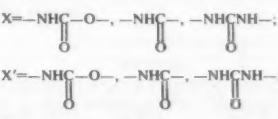
n is equal to 10 to 300.

10. A process for the production of polymeric acetals of the formula:



where

R is an alkylene with 1 to 6 carbon atoms;



or is absent;

R′ is an alkylene with 1 to 10 carbon atoms, an arylene, a biarylene, or is absent;

R″ is an alkylene with 1 to 6 carbon atoms, an oxaalkylene with 1 to 8 carbon atoms, a cycloalkylene, an arylene, or a biarylene;

A is absent;

n is from 20 to 110, comprising effecting a reaction of polyaddition of a diol of the formula:

$$HO-R-X-R'-X'R-OH,$$

where R, R′, X and X′ are as, defined above, with a divinyl ether of the formula:

$$CH_2{=}CH-O-R''-O-CH{=}CH_2,$$

where R″ is as defined above, in the presence of an acid catalyst.

3,929,732

LOW TEMPERATURE RESISTANT POLYURETHANE ELASTOMERS

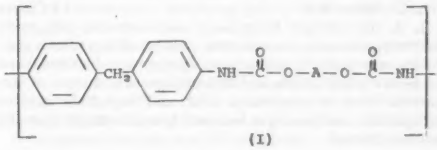
Tilak M. Shah, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 16, 1974, Ser. No. 506,310

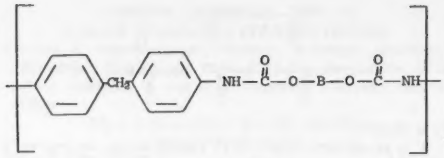
Int. Cl.² C08G *18/66*

U.S. Cl. 260—77.5 AN **7 Claims**

1. A thermoplastic polyurethane elastomer characterized by the presence therein of each of the recurring units having the formulae:



(I)



(II)

wherein A is the residue of a poly(1,4-butylene azelate) HO—A—OH having a molecular weight in the range of 2300 to 3500, B is the residue of an extender diol HO—B—OH selected from the class consisting of aliphatic diols having from 2 to 6 carbon atoms inclusive and the bis(2-hydroxyethylether) of hydroquinone, and wherein the overall proportion of recurring units (I) to recurring units (II) is in the range of about 1:2 to about 1:12.

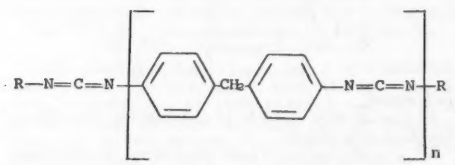
3,929,733

POLYCARBODIIMIDES FROM 4,4'-METHYLENEBIS(PHENYL ISOCYANATE) AND CERTAIN CARBOCYCLIC MONOISOCYANATES

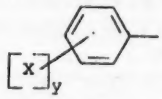
Louis M. Alberino, Cheshire, and William J. Farrissey, Jr., Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 2, 1974, Ser. No. 511,129
Int. Cl.² C08G *18/00*
U.S. Cl. 260—77.5 R **10 Claims**

1. A terminated polycarbodiimide having the formula:



wherein *n* is an integer having an average value from 6 to 20 and R is selected from the group consisting of cyclohexyl and



wherein X is a member selected from the group consisting of lower-alkyl, lower-alkoxy, and halo, and y is a whole number from 0 to 2.

3,929,734

FIRE-RESISTANT POLYAMIDE FROM BROMINATED AROMATIC DICARBOXYLIC ACID DIARYL ESTER

Cecile Bernier, Bagneux; Monique Jouhaneau, Issy-Les-Moulineaux, and Pierre Poisson, Antony, all of France, assignors to Aquitaine Total Organico, France

Filed Feb. 4, 1974, Ser. No. 439,122
Claims priority, application France, Feb. 8, 1973, 73.04442; Feb. 14, 1973, 73.05159
Int. Cl.² C08G *69/42*
U.S. Cl. 260—78 R **13 Claims**

1. A fire-resistant brominated semi-aromatic polyamide thermoplastic resin condensation product of ingredients consisting essentially of at least one alpha,omega-diaminoalkane of 4–30 carbon atoms and at least one aryl diester of isophthalic acid or terephthalic acid, said isophthalic acid or terephthalic acid having at least one bromine on the aromatic nucleus thereof.

3,929,735

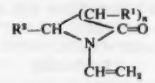
COPOLYMERS OF AN N-VINYL LACTAM AND AN UNSATURATED LACTONE

Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Jan. 9, 1973, Ser. No. 322,109
Int. Cl.² C08F *15/02*
U.S. Cl. 260—78.3 UA **8 Claims**

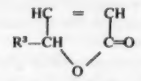
1. A copolymer comprising approximately by weight

a. 5 to 99% of an N-vinyl lactam of the formula



wherein R^1 is hydrogen, methyl or ethyl, R^2 is hydrogen or alkyl of 1 to 4 carbon atoms, and n is an integer of 2 to 4: and

b. 1 to 95% of an unsaturated lactone selected from the group consisting of compounds having the formula



wherein R^3 is hydrogen, an alkyl group or an alkoxy group.

3,929,736

PROCESS FOR PREPARING RESIN FOR PRINTING INK USE

Hisatake Sato, Yokohama, Japan, assignor to Nippon Oil Company Ltd., Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,757
Claims priority, application Japan, Apr. 17, 1973, 48-42682
Int. Cl.³ C08G *63/18*; C08F *240/00*
U.S. Cl. 260—78.4 D **12 Claims**

1. A process for preparing a resin suitable for printing ink use which comprises using as the starting oil to be polymerized a mixture selected from the group consisting of a reaction mixture obtained by heating at a temperature of 100° – 300°C. that fraction containing diolefins of 5 carbon atoms and of a boiling point in the range of 20° – 80°C. of the thermally cracked product oil of petroleum fractions and a mixture of said reaction mixture with that fraction of a boiling point in the range of 140° – 280°C. of the thermally cracked product oil of petroleum fractions, polymerizing said selected mixture in the presence of a Friedel-Crafts type catalyst, and thereafter reacting the resulting thermoplastic resin with a compound selected from the group consisting of the unsaturated carboxylic acids and the anhydrides thereof, said compound being used in an amount of 0.01 – 0.2 mole per 100 grams of said thermoplastic resin, thereby forming a resin which is soluble in a nonaromatic hydrocarbon solvent and having a softening point of above 100°C.

3,929,737

MALEIC ANHYDRIDE-MODIFIED RESIN BACKBONE

James J. Tazuma, Stow, and Mario D. Zadra, Barberton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 30, 1974, Ser. No. 510,332
Int. Cl.³ C08F *8/46, 236/04*
U.S. Cl. 260—78.4 D **10 Claims**

1. A resinous material characterized by having a softening point in the range of about 45°C to about 100°C having a basic resin backbone of piperylene and methyl branched monoolefins which comprises about 50 to about 60 mole percent units derived from piperylene and about 20 to about 30 mole percent units derived from monoolefins selected from at least one methyl branched chain α or β monoolefin containing 4 to 6 carbon atoms, where the mole ratio of piperylene to said

branched monoolefin is about 0.8/1 to about 2/1, in combination with about 10 to about 30 mole percent units derived from maleic anhydride, based on the total resin composition.

2. The resinous composition of claim 1 prepared by the method which comprises the steps of (A) reacting about 30 to about 60 parts by weight maleic anhydride, or about 10 to about 25 parts by weight maleic anhydride in the presence of an organoperoxide at a temperature in the range of about 150°C to about 250°C with 100 parts by weight of a hydrocarbon-derived resin having a softening point in the range of about 10°C to about 50°C prepared by polymerizing in the presence of a catalyst selected from boron trifluoride and boron trifluoride etherate, a monomer mixture which comprises about 40 to about 70 weight percent piperylene, and correspondingly, about 60 to about 30 weight percent of at least one monoolefin selected from methyl branched chain α or β monoolefin containing 4 to 6 carbon atoms, where the weight ratio of piperylene to said branched chain monoolefin is about 0.8/1 to about 2.0/1 and (B) removing unreacted maleic anhydride, if any, by distillltion.

3,929,738
PRODUCTION OF LOW MOLECULAR WEIGHT POLYANHYDRIDE COMPOUNDS

Omer E. Curtis, Jr., Morristown; Harold W. Tuller, Long Valley; Charles T. O'Neill, Dover, and Ralph W. Nussbaum, West Orange, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 81,616, Oct. 16, 1970, Pat. No. 3,732,332. This application Mar. 26, 1973, Ser. No. 345,172

Int. Cl.² C08F *2/02, 222/08*

U.S. Cl. 260—78.5 R **18 Claims**

1. A low molecular weight polyanhydride having a softening point within the range of about 111° to 156°C, said polyanhydride being the reaction product of the mass polymerization process, in the absence of a polymerization catalyst, of a maleic monomer selected from the group consisting of maleic acid, maleic anhydride, anhydrides which rearrange to maleic anhydrides and the halo-, aryl-, aralkyl-, alkyl-, or cycloalkyl-substituted derivatives thereof and at least one alkyl-substituted styrene in molar proportions of said maleic monomer relative to said alkyl-substituted styrene of greater than 1:1, said polymerization process being effected by heating at least a major portion of the maleic monomer to a temperature of about 160° to about 200°C, adding the alkyl-substituted styrene to said maleic monomer, with agitation, at a rate which permits control of the heat of reaction and continuing the polymerization until essentially all of said maleic monomer and alkyl-substituted styrene have polymerized.

3,929,739
NOVEL FLOCCULENT TERPOLYMERS

Eugene S. Barabas, Watchung, and Frederick Grosser, Midland Park, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,810

Int. Cl.² C08F *220/18, 220/40, 220/54, 220/56*

U.S. Cl. 260—78.5 B **11 Claims**

1. A water soluble terpolymer of a) about 20–50 weight percent acrylamide, b) about 45–75 weight percent dimethylamino-methylacrylamide and c) about 5–25 weight percent of a third ethylenically unsaturated monomer selected from the group consisting of acrylonitrile, vinyl acetate, vinyl-isobutylether, chloroprene, dimethylmaleate, diethylmaleate, allyl acetate, methylacrylate, ethylacrylate, methyl methacrylate, and 2-vinyl pyridine said termonomer having lower solubility in water than either (a) or (b); the value of (a), (b) and (c) being such that the total monomers present amount to 100 percent and the number average molecular weight of the terpolymer being greater than 30,000.

3,929,740
HYDROLYZED COPOLYMER OF ACRYLONITRILE AND AN UNSATURATED SULFONIC ACID

Fritz Engelhardt; Willi Gunzert, both of Frankfurt am Main; Hellmut Georg Jalke, Wiesbaden; Joachim Ribka, Offenbach am Main-Burgel, and Gerhard Weckler, Sulzbach, Taunus, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 400,706, Sept. 26, 1973, abandoned. This application Sept. 12, 1974, Ser. No. 505,523

Claims priority, application Germany, Oct. 9, 1972, 2249443

Int. Cl.² C08F *28/00, 120/44*

U.S. Cl. 260—79.3 MU **6 Claims**

1. A water-soluble product obtained from a copolymer of acrylonitrile and an unsaturated sulfonic acid containing 0.1 to 30% by weight of sulfonic acid radicals and having a K-value of 30 to 140, by hydrolyzing said copolymer at a temperature of 70° to 150°C. in an aqueous alkali metal hydroxide solution containing from 8 to 35% by weight of alkali metal hydroxide to saponify the nitrile groups of said copolymer to $-CONH_2$ and —COOR groups where R is the cation of said alkali metal hydroxide and then adjusting the resulting solution to a pH of 6 to 9, said product containing

2 to 15% by weight $-CONH_2$ groups
20 to 68% by weight —COOR groups
0 to 0.5% by weight —CN groups
2 to 20% by weight $-SO_3R$ groups

calculated on the solid product and having a K-value of 80 to 150 and said product being useful as a textile aid for sizing and dye padding purposes.

3,929,741
HYDROPHILIC ACRYLAMIDO POLYMERS

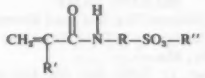
Richard A. Laskey, Washington, N.J., assignor to Datascope Corporation, Paramus, N.J.

Filed July 16, 1974, Ser. No. 488,933

Int. Cl.² C08F *28/02;* **C08G** *75/18*

U.S. Cl. 260—79.3 M **11 Claims**

1. A water insoluble cross-linked hydrophilic polymer capable of absorbing many times its own weight of water, said polymer consisting essentially of at least 95% by weight of a polymerized monomer of the formula:



wherein R is selected from the group consisting of straight and branched chain alkylene of up to 10 carbon atoms, R′ is selected from the group consisting of hydrogen and lower alkyl, and R″ is a monovalent cation cross-linked by up to 5% by weight of a cross-linking monomer.

3,929,742
POLY(P-BENZENESULFONAMIDE)

George E. Hulse, and R. James Kersting, both of Pittsburgh, Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed July 23, 1973, Ser. No. 382,018

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C08G *75/30*

U.S. Cl. 260—79.3 R **1 Claim**

1. A process for preparing poly(p-benzenesulfonamide) comprising:

a. heating for at least 1 hour at a temperature of 180° to 210°C. in the absence of air, a melt of a compound having the general formula, $R'R''N{\cdot}SO_2{\cdot}C_6H_4{\cdot}NH_2X$, where X is Br or Cl; and R′ and R″ may be the same or different and are H, alkyl having from 1–4 carbon atoms, or R′ and R″ together comprise a cyclic alkylene;

b. dissolving the heated melt in aqueous alkali; and

c. acidifying the solution by adding acid to a pH of 4–6, whereby the poly(p-benzenesulfonamide) precipitates.

3,929,743
POLYAMPHOLYTES

John A. Sramek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 296,438, Oct. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 178,502, Sept. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 794,356, Jan. 27, 1969, abandoned. This application Feb. 11, 1974, Ser. No. 441,591

Int. Cl.² C08F *8/30*

U.S. Cl. 260—80.8 **10 Claims**

1. A polyampholyte having a molecular weight of from about 10,000 to about 200,000 and containing pendent carboxylic acid groups and pendent carboxylic amino ester groups of the formula

$$-COO\ CHR^2CHR^3NHR^1$$

each of R^1, R^2 and R^3 being hydrogen or a lower alkyl group containing 1–7 carbon atoms wherein said polyampholyte is prepared by imination of a copolymer which comprises 16–40% by weight of a monoethylenically unsaturated carboxylic acid monomer and the balance being from 10–84% by weight of a hard monomer selected from the group consisting of styrene, acrylonitrile, cycloalkyl acrylates and cycloalkyl methacrylates wherein said cycloalkyl group contains 5–7 carbon atoms, lower alkyl esters of methacrylic acid wherein said lower alkyl group contains 1–3 carbon atoms and mixtures thereof and 10–84% by weight of a soft monomer selected from the group consisting of alkyl esters of acrylic acid wherein said alkyl group contains 1–12 carbon atoms, higher alkyl esters of methacrylic acid wherein said higher alkyl group contains 4–12 carbon atoms vinyl acetate and mixtures thereof; wherein said polyampholyte is water soluble upon reaction with base and the ratio of carboxylic acid groups to carboxylic amino ester groups is from about 19:1 to about 0.25:1.

3,929,744
POLYMERIC ISOCYANATES AND PROCESS FOR MAKING SAME

Howard J. Wright, Kansas City, Mo., and Kenneth E. Harwell, Merriam, Kans., assignors to Cook Paint and Varnish Company, Kansas City, Mo.

Filed Oct. 31, 1974, Ser. No. 519,660

Int. Cl.² C08F *26/02*, *126/02*, *226/02*

U.S. Cl. 260—80.73 **15 Claims**

1. A process for preparing an isocyanate-functional polymer which comprises reacting a secondary alpha-carbon or tertiary alpha-carbon amide polymer -having at least one $—CONH_2$ group attached directly to a secondary or tertiary carbon atom, respectively, in the polymer chain, with a hypochlorite and recovering the isocyanate-functional polymer thus formed from the reaction mixture.

3,929,745
VANADIUM ORGANOPHOSPHATES

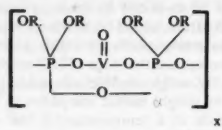
James R. Huerta; Amos R. Anderson, and Jeffrey G. Meyer, all of Adrian, Mich., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 102,949, Dec. 30, 1970, abandoned, which is a division of Ser. No. 836,169, June 24, 1969, Pat. No. 3,595,890. This application Nov. 20, 1972, Ser. No. 308,066The portion of the term of this patent subsequent to July 27, 1988, has been disclaimed.

Int. Cl.² C08F *4/68*, *210/18*, *210/16*

U.S. Cl. 260—80.78 **18 Claims**

1. A catalyst composition comprising a vanadium organophosphate compound having the formula:



wherein R is methyl, ethyl, propyl, butyl or mixtures thereof and x is 2 to 6 and an organoaluminum halide wherein the molar ratio of Al/V in said catalyst composition is in the range of 1:1 to 20:1.

3,929,746
SULPHUR VULCANIZABLE ELASTOMERIC COPOLYMERS

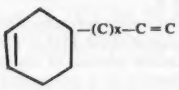
Harold Tucker, Akron, and Robert J. Minchak, Parma Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 12, 1962, Ser. No. 243,987

Int. Cl.² C08F *210/00*, *212/00*, *28/00*

U.S. Cl. 260—80.78 **2 Claims**

1. Vulcanizable, elastomeric terpolymers of ethylene, propylene and a mixture of terminally unsaturated cyclohexenyl compounds of the general formula



in which *x* is an integer from 2 to 10, inclusive, said ethylene and propylene monomeric units being present in approximately equi-mole proportions, and said terminally unsaturated cyclohexenyl compounds constituting at least about 0.3 mole percent of the terpolymer based on the total monomeric units present.

3,929,747
PROCESS FOR PREPARING PETROLEUM RESIN COPOLYMERS OF C_4 AND C_5 ALIPHATIC MONOOLEFIN FRACTIONS AND STYRENE OR ITS DERIVATIVES

Ken-ichi Kudo; Yoshihiko Kitagawa, and Hideyuki Kuribayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 2, 1974, Ser. No. 528,735

Claims priority, application Japan, Dec. 6, 1973, 48-139123

Int. Cl.² C08F *210/00*, *212/00*, *240/00*

U.S. Cl. 260—80.78 **13 Claims**

1. A process for manufacturing a petroleum resin, characterized by copolymerizing a monomer mixture of 20 to 80% by weight of aliphatic monoolefins mainly of four and five carbon atoms and 80 to 20% by weight of styrene and/or a styrene derivative with a catalyst system comprising an organoaluminum compound represented by the general formula AlR_nX_{3-n} (wherein R is an alkyl group having 1 to 4 carbon atoms, X is a halogen atom, and *n* is 2 or 1.5) as main catalyst and an alkyl halide or a hydrogen halide as co-catalyst, in a hydrocarbon solvent at a temperature of 0° to 60°C.

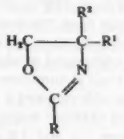
3,929,748

EMULSION POLYMERIZATION PROCESS EMPLOYING AN OXAZOLINE AS CHAIN TRANSFER AGENT

Louis A. Jurisch, Marengo, Ill., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Oct. 15, 1973, Ser. No. 406,760
Int. Cl.² C08F *212/08*, *112/08*
U.S. Cl. 260—88.1 P 11 Claims

1. In a process for the production of the homopolymers of styrene and of vinyl acetate, or the copolymer of styrene and methacrylic acid by emulsion polymerization or by solution polymerization, the improvement consisting of using as the chain transfer agent an oxazoline corresponding to the formula:



where R^1 and R^2 are hydroxymethyl, or the group $RCOOCH_2$—, and R is an alkyl group of 1 to 19 carbon atoms.

3,929,749

PROCESS FOR RECOVERING BORON TRIFLUORIDE

Terence Alfred Cooper, Newark, Del., and Anestis Leonidas Logothetis, Louisville, Ky., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Mar. 1, 1974, Ser. No. 447,256
Int. Cl.² C08F *210/00*, *212/00*, *218/00*; C01B *35/06*
U.S. Cl. 260—86.7 5 Claims

1. In a process for recovering boron trifluoride from a copolymer containing ethylene units and alkyl acrylate units complexed with boron trifluoride, the improvement which comprises heating a solution of said copolymer under anhydrous conditions in an inert liquid solvent for said copolymer to a temperature and at a pressure sufficient to decompose the alkyl acrylate-boron trifluoride complex while simultaneously passing superheated inert liquid or gaseous solvent for the copolymer into the copolymer solution so as to cause turbulence of the solution of copolymer, thereby removing gaseous uncomplexed boron trifluoride from the liquid mixture for recycle.

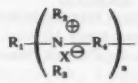
3,929,750

PROCESS FOR PREPARING POLYIONCOMPLEXES

Tsuchida Eishun, Tokyo, and Osada Yoshihito, Mito, both of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,513
Claims priority, application Japan, May 13, 1972, 47-47536; May 13, 1972, 47-47537
Int. Cl.² C08L *23/00*, *25/00*, *29/00*; C08F *210/00*
U.S. Cl. 260—874 5 Claims

1. A process for preparing a water soluble polyioncomplex consisting essentially of reacting an aqueous solution of a polycation of the integral type having the general formula



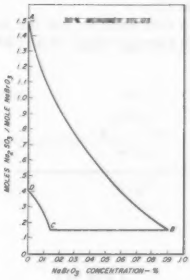
wherein R_1 and R_4 are selected from the group consisting of alkylene, aralkylene, arylene, piperazine ring, and alicyclic radicals, R_2 and R_3 are similar or dissimilar radicals, having carbon atoms not exceeding 3, selected from the group consisting of alkyl, alkoxyalcohol and benzylalkyl radicals, X^- is a counterion, and *n* is a positive integer, an aqueous solution of a polyanion selected from the group consisting of polyacrylic and polymethacrylic acids at a pH of 4–11 in the presence of alkali, the mole ratio of polycation to polyanion being in the range from 1:1 to 1:3.

3,929,751

HIGH MOLECULAR WEIGHT ACRYLAMIDE POLYMER PRODUCTION BY HIGH SOLIDS SOLUTION POLYMERIZATION

David Benedict Gershberg, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 14, 1971, Ser. No. 133,977
Int. Cl.² C08F *3/90*, *15/00*, *15/14*
U.S. Cl. 260—89.7 R 5 Claims



1. A method of producing a substantially completely noncarboxylated, substantially completely water-soluble polymer of acrylamide having an intrinsic viscosity of at least 13 and therefore a molecular weight of at least about 8 million which comprises subjecting a reaction media consisting essentially of (A) acrylamide, (B) up to 50%, by weight, based on the weight of acrylamide, of a monomer copolymerizable therewith, (C) a sodium bromate-sodium sulfite catalyst and (D) water, to polymerizing conditions comprising a temperature of from about 10°C. to about 30°C. and a pH of from about 4.7 to about 5.9, said reaction media having a monomer solids content of from about 30% to about 60%, at least one dimension of said reaction media mass having a thickness of not more than about ¾ inch, the catalyst concentration being (1) within the area of curve ABCDA of the drawings for at least 30% monomer solids, (2) within the area of curve EFGHE of the drawings for at least 40% monomer solids and (3) within the area of curve JKLMJ of the drawings for at least 50% monomer solids.

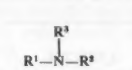
3,929,752

PREPARATION OF SOL CHLOROPRENE POLYMERS

Terence Alfred Cooper, and Ausat Ali Khan, both of Newark, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Apr. 5, 1974, Ser. No. 458,185
Int. Cl.² C08F 2/22, 36/18
U.S. Cl. 260—92.3 6 Claims

1. In the process of polymerizing in the presence of a C_8–C_{20} alkyl mercaptan and a carboxylated emulsifying agent in aqueous emulsion at a pH of about 10–13, chloroprene containing from 0 to about equal weight of a copolymerizable monomer at a temperature from the freezing point of the emulsion to about 52°C, the improvement of having present in the emulsion about 0.05–1 part by weight per 100 parts of the starting monomer, of an amine having the following formula (1)

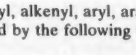


(1),

wherein

R^1 is C_6–C_{20} alkyl, alkenyl, aryl, aralkyl, or alkaryl;

R^2 is represented by the following formula (2)



(2)

wherein n is a number having an average value of 1 to about 50, and

R^4 in each parenthetical unit is independently of any other such unit hydrogen or methyl; and

R^3 is phenyl, benzyl, a C_1–C_8 alkyl or a radical having the above formula (2);

with the proviso that when R^3 has the above formula (2), the sum of the average values of n in R^2 and R^3 is at most about 50.

3,929,753

METHOD FOR PRODUCING HIGH BULK DENSITY POLYVINYL CHLORIDE

Iko Itoh; Takeshi Sekihara, and Tomoyuki Emura, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 13, 1973, Ser. No. 415,358
Claims priority, application Japan, Nov. 21, 1972, 47-117449
Int. Cl. C08f 114/02, 114/16
U.S. Cl. 260—92.8 W 8 Claims

1. A method for producing polyvinyl chloride or a copolymer of vinyl chloride having a high bulk density by the suspension polymerization of vinyl chloride alone or a mixture consisting predominantly of vinyl chloride and at least one monomer copolymerizable therewith in the presence of an oil soluble catalyst which comprises initiating the polymerization reaction in the presence of (1) a partially saponified polyvinyl acetate having a degree of saponification of 70 to 80 mol % and an average degree of polymerization of 500 to 900 as a suspension stabilizer and in the presence of said oil soluble catalyst, and when the polymerization conversion reaches 3 to 40% by weight, adding (2) a partially saponified polyvinyl acetate having a degree of saponification of 75 to 95 mol % and an average degree of polymerization of 1000 or more to the polymerization system.

3,929,754

PROCESS FOR THE PREPARATION OF ETHYLENE POLYMERS BY BOTH FREE-RADICAL AND IONIC POLYMERISATION REACTIONS

Pierre Gloriod, Bully-les-Mines; Bernard Levresse, Lillebonne, and Jean-Pierre Machon, Bethune, all of France, assignors to Ethylene Plastique, Courbevoie, France

Filed Oct. 11, 1973, Ser. No. 405,653
Claims priority, application France, Oct. 13, 1972, 72.36443
Int. Cl.² C08F 4/66, 10/02
U.S. Cl. 260—94.9 E 1 Claim

1. A continuous process for the preparation of ethylene polymers by polymerisation or copolymerisation of ethylene in a polymerisation reactor at a pressure of at least 1000 bars and at a temperature of from 220° to 270° C. in the presence of a catalyst of the Ziegler type, the dwell time of the catalyst in the reactor being not more than 1.50 seconds, the catalyst comprising an organic compound of aluminum selected from the group consisting of trialkylaluminum and diethylaluminum chloride; and titanium trichloride and a titanium tetrapropoxide, the relative ratio of titanium tetrapropoxide to titanium trichloride being between 1:2 and 1:8 moles for controlling the relative degree of free radical polymerisation and ionic polymerisation.

3,929,755

PYROLYZED ROSIN PRODUCTS AS SYNTHETIC RUBBER TACKIFIERS

Ray F. Severson; Walter H. Schuller; N. Mason Joye, Jr., and Ray V. Lawrence, all of Lake City, Fla., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 1, 1973, Ser. No. 365,899
Int. Cl.² C09F 1/00
U.S. Cl. 260—106 7 Claims

1. A process for making ponderosa FF wood rosin effective as a rubber tackifier which process comprises pyrolyzing said rosin at a temperture of about 500°–800°C in the absence of catalyst for a period of about 0.01 to 10 seconds.

3,929,756

SYNTHETICALLY PRODUCED TRIDECAPEPTIDE HAVING THE SAME ACTIVITY AS THE HYPOTHALAMIC SUBSTANCE, NEUROTENSIN

Susan E. Leeman, Newton, and Robert E. Carraway, Brockton, both of Mass., assignors to Brandeis University, Waltham, Mass.

Filed Nov. 21, 1973, Ser. No. 417,816
Int. Cl.² C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 R 6 Claims

1. The chemically synthesized tridecapeptide, pyroglutamyl-leucyl-tyrosyl-glutamyl-asparaginyl-lysyl-prolyl-arginyl-arginylprolyl-tyrosyl-ileucinyl-leucyl-OH, said tridecapeptide having the same activity as the hypothalamic substance, neurotensin.

3,929,757

METHOD FOR THE PREPARATION OF HIGH PURITY KALLIKREIN

Miyazakai Hiroshi, Kawasaki; Kato Kazuo, Tokyo, and Koyama Michinori, Tokyo, all of Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,229
Claims priority, application Japan, May 17, 1973, 48-54136
Int. Cl.² C07C 103/52; C08H 1/00
U.S. Cl. 260—112.5 R 4 Claims

1. A method for the preparation of high purity kallikrein, which comprises contacting an autolysate obtained from organs of mammals, human urine or a low purity kallikrein-containing solution with a highly cross-linked macroporous type anion exchange resin having a tertiary amine as an exchange

group for having kallikrein adsorbed in said anion exchange resin, and washing the kallikrein absorbed anion exchange resin with an electrolyte having a pH of 6.0 to 8.5 and a concentration of 0.25 M or less and eluting the kallikrein with an electrolyte having a pH of 6.0 to 8.5 and a concentration of 0.6M or more.

3,929,758

CYCLIZATION OF CYSTEINE-CONTAINING PEPTIDES

John Lawrence Hughes, Kankakee; Jay Kenneth Seyler, Bourbonnais, and Robert Chung-Huang Liu, Kankakee, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Sept. 12, 1974, Ser. No. 505,344
Int. Cl.² C07C *103/52*; **C08H** *1/00*
U.S. Cl. 260—112.5 R **38 Claims**

1. In a process for preparing a peptide having a disulfide ring structure, the step of holding a peptide which contains at least two cysteine moieties in its amino acid chain one of which contains a free sulfhydryl function and the other having its sulfhydryl function protected by an n-alkylthio group which participates in a disulfide bond with the thiol function of said other moiety in a solution substantially free of oxygen until rearrangement has taken place to yield the cyclic disulfide peptide.

3,929,759

P-GLU-D-PHE-TRP-SER-TYR-D-ARG-LEU-ARG-PRO-GLY-NH_2 AND INTERMEDIATES

Theodore J. Foell, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,591
Int. Cl.² C07C *103/52*; **A61K** *37/00*
U.S. Cl. 260—112.5 LH **8 Claims**

1. A compound selected from the group consisting of

L-p-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Arg-L-Leu-L-Arg-L-Pro-Gly-NH_2

and

R^4-L-p-Glu-D-Phe-L-Trp-L-Ser(R^3)-L-Tyr(R^3)-D-Arg(N^G-R^5)-L-Leu-L-Arg(N^G-R^1)-L-Pro-Gly-R

and its non-toxic salts; wherein

R is selected from the class consisting of NH_2, OH, O—(lower)alkyl and O-benzyl; R^1 and R^5 are selected form the class consisting of hydrogen and a protecting group for the N , N and N nitrogen atoms of arginine selected from nitro, tosyl, benzyloxycarbonyl and adamantyloxycarbonyl;

R^3 is selected form the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl;

R^4 is selected from the class consisting of hydrogen and an α-amino protecting group, with the proviso that at least one of R^1, R^2, R^3 and R^5 is a protecting group.

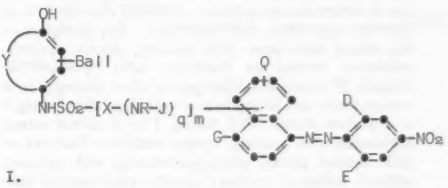
3,929,760

CYAN IMAGE-PROVIDING PHENYLAZONAPHTHYL DYES

Richard A. Landholm; Jan R. Haase, both of Rochester, N.Y., and James J. Krutak, Sr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

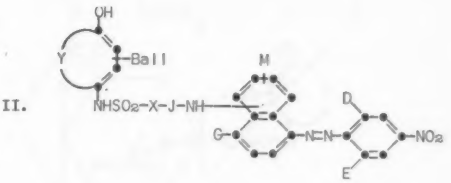
Continuation-in-part of Ser. No. 331,727, Feb. 12, 1973, abandoned. This application Feb. 5, 1974, Ser. No. 439,788
Int. Cl.² C09B *29/10, 29/20*; **G03C** *5/30, 5/54*
U.S. Cl. 260—197 **14 Claims**

1. A cyan image dye-providing compound having a formula as follows:



I.

or



II.

wherein

Ball represents an organic ballasting group containing at least 8 carbon atoms which renders said compound nondiffusible in a photographic element during development in an alkaline processing composition;

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

X represents $—R^2—L_n—R^2_p—$ where each R^2 can be the same or different and each represents alkylene having 1 to 8 carbon atoms; phenylene; or phenylene substituted with chloro, bromo, cyano, nitro, methoxy, methyl, carboxy or sulfo; L represents oxy, carbonyl, carboxyamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; *n* is an integer having a value of 0 or 1; *p* is 1 when *n* equals 1 and *p* is 1 or 0 when *n* equals 0, provided that when *p* is 1 the carbon content of the sum of both R^2 radicals does not exceed 14 carbon atoms;

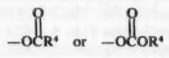
R represents hydrogen or alkyl having 1 to 6 carbon atoms;

J represents sulfonyl or carbonyl;

m and *q* each represent an integer having a value of 0 or 1;

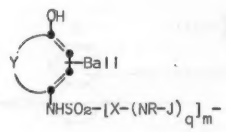
Q represents hydrogen, hydroxy or $—NHCOR^3$ or $—NHSO_2R^3$ wherein R^3 is alkyl having 1 to 6 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, or phenyl substituted with carboxy, chloro, methyl, methoxy or sulfamoyl;

G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof or a hydrolyzable acyloxy group having the formula:

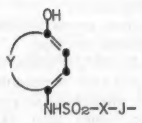


wherein R^4 is alkyl having 1 to 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro;

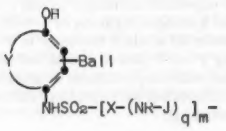
D represents chloro, bromo, fluoro, cyano, nitro, trifluoromethyl, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, carboxy, —COOR⁴ wherein R^4 is as described previously, fluorosulfonyl, —SO_3-phenyl or —SO_3-phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; sulfo, —$SO_2NR^5R^6$ wherein R^5 represents hydrogen or alkyl having 1 to 6 carbon atoms and R^6 represents hydrogen, alkyl having 1 to 6 carbon atoms, alkyl having 1 to 4 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; alkylcarbonyl having 1 to 8 carbon atoms, or phenylcarbonyl, with the proviso that the carbon content of the sum of R^5 and R^6 not exceed 14 carbon atoms; —$CON(R^5)_2$ wherein each R^5 can be the same or different and is as described previously; alkylsulfonyl having 1 to 8 carbon atoms; alkylsulfonyl having 1 to 6 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl; phenylsulfonyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; or D represents



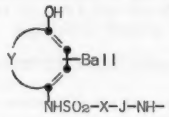
or



provided that the



on the naphthalene nucleus of Formula I is replaced by M or the



on the naphthalene nucleus of Formula II is replaced by Q wherein Car, X, J, R, *q* and *m* are as described previously;

E represents hydrogen, chloro, bromo, fluoro, nitro, cyano or trifluoromethyl;

M represents hydrogen, carboxy, —$COOR^4$ wherein R^4 is as described previously, sulfo, —$SO_2NR^5R^6$, —$CON(R^5)_2$ wherein R^5 and R^6 are as described previously, alkylsulfonyl having 1 to 8 carbon atoms; alkylsulfonyl having 1 to 6 carbon atoms substituted with cyano or hydroxy; phenylsulfonyl or phenylsulfonyl substituted with sulfamoyl, carboxy, fluorosulfonyl or methoxy;

with the proviso there be no more than one sulfo and no more than one carboxy present in said compound.

3,929,761

3-DEOXYKANAMYCIN

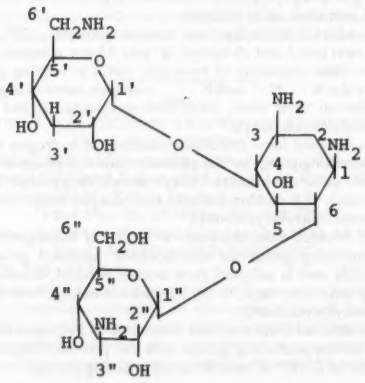
Sumio Umezawa; Hamao Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation-in-part of Ser. No. 203,454, Nov. 30, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 449,991

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 K **1 Claim**

1. 3′-Deoxykanamycin of the formula



3,929,762

3'-DEOXY DERIVATIVES OF NEAMINE AND ITS RELATED AMINOGLYCOSIDIC ANTIBIOTICS, AND THE PRODUCTION THEREOF

Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Osamu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

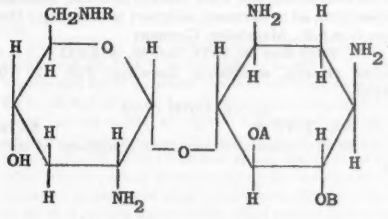
Continuation-in-part of Ser. No. 390,403, Aug. 22, 1973. This application Dec. 5, 1973, Ser. No. 421,821

Claims priority, application Japan, Aug. 23, 1972, 47-83671; Dec. 8, 1972, 47-122436

Int. Cl.[2] C07G *3/00*

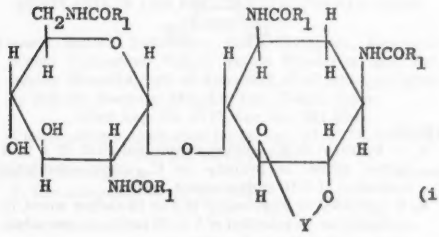
U.S. Cl. 260—210 AB 17 Claims

1. A process for the production of a 3'-deoxy derivative of an aminoglycosidic antibiotic of the formula:

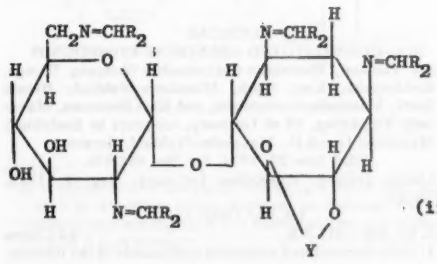


wherein R is hydrogen or alkyl of 1–4 carbon atoms; A is hydrogen or β-D-ribofuranosyl: B is hydrogen or 3-amino-3-deoxy-α-D-glucopyranosyl, provided that A is not β-D-ribofuranosyl when B is 3-amino-3-deoxy-α-D-glucopyranosyl, which comprises

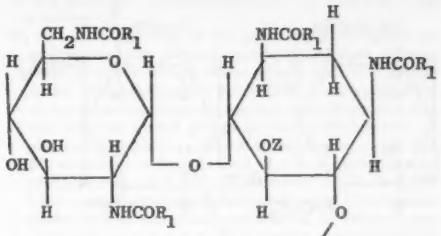
a. preferentially 3' sulfonating an amino-protected and hydroxyl-protected aminoglycoside selected from the group consisting of compounds of the formulae (i) through (vi):

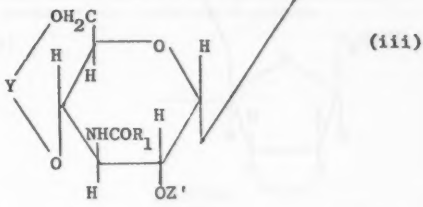


(i)

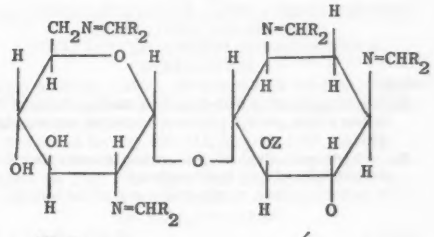


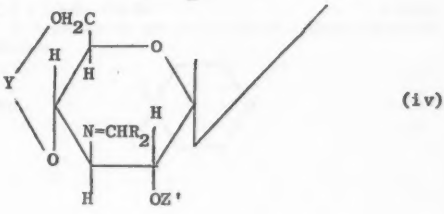
(ii)



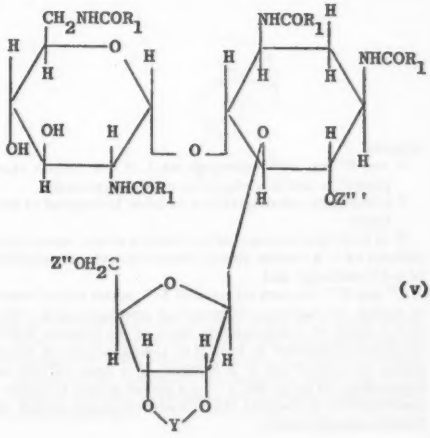


(iii)

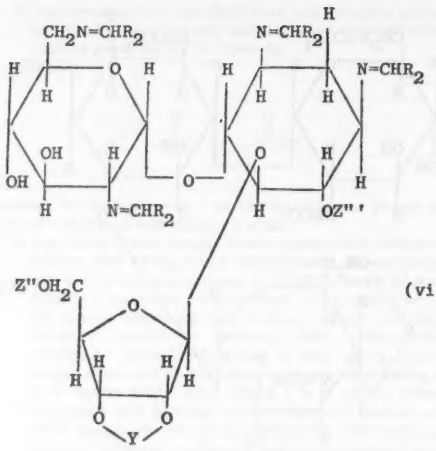




(iv)



(v)



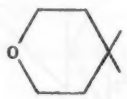
(vi)

wherein:

R_1 is hydrogen, alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, phenyl, phenoxy, benzyloxy or p-nitrobenzyloxy;

R_2 is hydrogen, alkyl of 1–6 carbon atoms, phenyl, p-methoxylphenyl or o-hydroxyphenyl;

Y is cyclohexylidene, tetrahydropyranyl of the formula



or

a group of the formula

wherein:

P and P′ are each hydrogen, alkyl of 1–4 carbon atoms, phenyl, p-methoxylphenyl or o-hydroxyphenyl;

Z is hydrogen, alkanoyl of 2–5 carbons, hemiacetal or hemiketal;

Z′ is hydrogen, alkanoyl of 2–5 carbon atoms, benzyl, alkylsulfonyl of 1–4 carbon atoms, benzylsulfonyl, phenylsulfonyl or p-tolylsulfonyl; and

Z″ and Z‴ are each alkanoyl of 2–5 carbon atoms, benzoyl or benzyl, by reacting said protected aminoglycoside with up to 1.5 moles of a sulfonylating agent of the formula R_3SO_2X or $(R_3SO_2)O$ wherein R_3 is alkyl of 1–4 carbon atoms, benzyl, phenyl or p-tolyl and X is halogen, in a basic solvent at a temperature of up to 100° C. for a period of time sufficient to preferentially sulfonylate the 3′-hydroxyl group of said protected aminoglycoside;

b. removing the 3′-sulfonic ester from the resultant product by 3′-iodination or 3′-bromination; and

c. reducing the resultant 3′-iodinated or 3′-brominated product to form the corresponding 3′-deoxy derivative of said aminoglycoside.

3,929,763

N(6)-DISUBSTITUTED ADENOSINE COMPOUNDS

Erich Faulantl, Mannheim-Gartenstadt; Wolfgang Kampe, Heddesheim; Max Thiel, Mannheim; Harald Stork, Mannheim-Feudenheim, and Felix Helmut Schmidt, Mannheim-Seckenheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

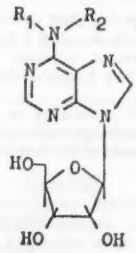
Filed May 30, 1974, Ser. No. 474,833

Claims priority, application Germany, July 31, 1973, 2338705

Int. Cl.² C07H *19/16*

U.S. Cl. 260—211.5 R **5 Claims**

1. An N(6)-disubstituted adenosine compound of the formula



wherein

R_1 is hydroxy- or C_{1-4}-alkoxy-substituted-alkyl of 1 to 8 carbon atoms, or hydroxy- or C_{1-4}-alkoxy-substituted cycloalkyl of 5-10 carbon atoms, and

R_2 is cycloalkyl or bicycloalkyl of 5 to 10 carbon atoms, or cycloalkyl or bicycloalkyl of 5 to 10 carbon atoms substituted by alkyl of 1 to 8 carbon atoms,

or a pharmacologically compatible salt thereof.

3,929,764

N(6)-DISUBSTITUTED ADENOSINE COMPOUNDS

Erich Fauland, Mannheim-Gartenstadt; Wolfgang Kampe, Heddesheim; Kurt Stach, Mannheim-Waldhof; Harald Stork, Mannheim-Feudenheim, and Karl Dietmann, Mannheim-Vogelstang, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

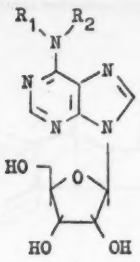
Filed June 25, 1974, Ser. No. 482,976

Claims priority, application Germany, Aug. 1, 1973, 2338963

Int. Cl.² C07H *19/16*

U.S. Cl. 260—211.5 R **14 Claims**

1. N(6)-disubstituted adenosine compounds of the formula:



(I),

wherein

R_1 is alkenyl of up to 6 carbon atoms, cycloalkenyl or cycloalkenyl-alkyl of 5 to 10 carbon atoms in the cyclic moiety and up to 6 carbon atoms in the alkyl moiety; and R_2 is alkenyl of up to 6 carbon atoms, cycloalkenyl of 5 to 10 carbon atoms, straight or branched-chain alkyl of up to 6 carbon atoms, cycloalkyl of 5 to 10 carbon atoms, bicycloalkyl of up to 10 carbon atoms, alkyl-cycloalkyl of from 5 to 10 carbon atoms in the cyclic moiety and up to 6 carbon atoms in the alkyl moiety, and alkyl-bicycloalkyl of up to 6 carbon atoms in the alkyl moiety and of up to 10 carbon atoms in the bicycloalkyl moiety;

and the pharmacologically acceptable salts thereof.

3,929,765

NOVEL 3-SUBSTITUTED-AMINOAZETIDINE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Yasushi Suzuki, Yokohama; Yukio Hasegawa, Kawasaki; Kunio Tsukamoto, Tokyo; Yoshio Hiramatsu, and Katsuhiko Miyasaka, both of Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co. Ltd., Tokyo, Japan

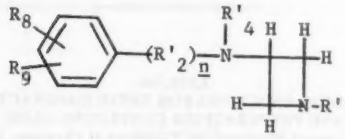
Filed Aug. 18, 1972, Ser. No. 281,804

Claims priority, application Japan, Aug. 21, 1971, 46-63722

Int. Cl.² C07D *205/04*

U.S. Cl. 260—239 A **9 Claims**

1. The compound of the formula



wherein

R′ is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, a mono- or diphenyl alkyl in which alkyl moiety has 1 to 4 carbon atoms, or a cycloalkyl of 3 to 6 atoms,

R′ is a straight or branched alkylene of 1 to 4 carbon atoms, *n* is 0 or 1,

R_8 and R_9, which may be the same or different, and are selected from the group consisting of hydrogen, halogen alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms or carboxyl, with the proviso that two adjacent t-butyl groups or the combination of an alkoxycarbonyl and a carboxyl group does not occur and R'_4 stands for hydrogen, alkyl of 1 to 4 carbon atoms, allyl, cycloalkyl of 3 to 7 carbon atoms, alkylcarbonyl of 2 to 4 carbon atoms or an alkoxycarbonyl of 2 to 4 carbon atoms; and an ammonium salt thereof in which ammonium salts are located at the 1-position, 3-substituted-N-position or 1-and 3-substituted-N-positions.

3,929,766

NOVEL 2[2-(1,3-DIAZACYCLOALK-2-ENYL)]BENZOPHENONE DERIVATIVES AND NOVEL 1,3-DIAZACYCLOALKENYL[2,1-a]ISOINDOLE DERIVATIVES

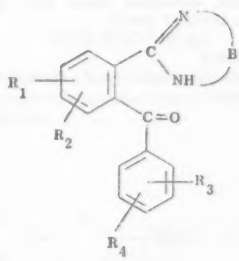
Werner Metlesics, Clifton, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 639,315, May 18, 1967, Pat. No. 3,888,846, which is a continuation-in-part of Ser. No. 626,965, March 30, 1967. This application July 30, 1974, Ser. No. 493,020

Int. Cl.² C07D *243/04*

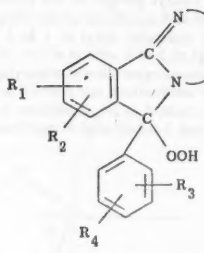
U.S. Cl. 260—239 BC **1 Claim**

1. A process for the preparation of a compound of the formula



wherein B represents an alkylene chain of 2 to 4 carbon atoms in which one or more of the hydrogens can be replaced by lower alkyl; and R_1, R_2, R_3, and R_4 are each independently selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, and trifluoromethyl

and the tautomers thereof, which comprises treating a hydroperoxy derivative of the formula:



wherein B, R_1, R_2, R_3, and R_4 are as defined hereinabove with a reducing agent selected from the group consisting of sodium sulfite and trialkyl phosphite.

3,929,767

PROCESS OF PRODUCING SEMI-SYNTHETIC PENICILLIN

Masuo Murakami, Tokyo; Akio Koda, Hoya; Mutsuo Takashima, Kawagoe; Etuo Takagi; Ichiro Sakoh, both of Tokyo; Hideya Matsuda, Urawa, and Tsutomu Suzuki, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

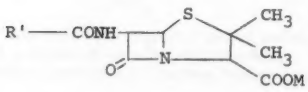
Filed Nov. 9, 1972, Ser. No. 305,007

Claims priority, application Japan, Nov. 16, 1971, 46-91642; Feb. 23, 1972, 47-19075

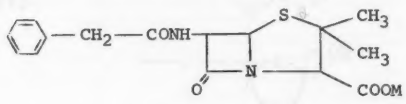
Int. Cl.[2] C07D *499/04*

U.S. Cl. 260—239.1 **1 Claim**

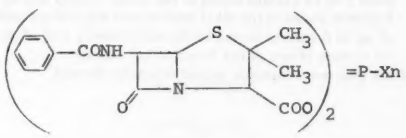
1. A process for the production of a semi-synthetic penicillin of the formula:



wherein R′ is a member selected from the group consisting of α-azidobenzyl, α-aminobenzyl, α-carboxybenzyl, isoxazolyl substituted by methyl, isoxazolyl substituted by phenyl, isoxazolyl substituted by chlorophenyl, phenoxypropyl, biphenylyl, quinoxalyl substituted by carboxy, and aminocyclohexyl and M is a member selected from the group consisting of hydrogen and an alkali metal, which comprises contact benzyl penicillin of the formula:



in which M is as defined in an inert solvent in the presence of a base and under cooling with 0.5 to 1 molar of a member selected from the group consisting of phosphorous trichloride, and phosphorous pentachloride to obtain an acid anhydride of penicillin of the formula:



in which X is chloro and *n* is 1 or 3, reacting said acid anhydride of penicillin with a phosphorous halide in an inert solvent in the presence of 3 to 5 mols of tertiary amine per mole of phosphorous halide in an inert solvent to obtain an iminohalide compound, reacting said iminohalide compound with a lower alkanol to obtain an iminoether compound condensing the iminoether compound with a member selected from the group consisting of R′COOH in which R′ is as defined above, and the corresponding acid anhydride and acid chloride and adding the condensed product to a member selected from the group consisting of water and lower alkanol.

3,929,768

STEROIDS, PROCESSES FOR THEIR MANUFACTURE AND PREPARATIONS CONTAINING SAME

Ralph Lennart Brattsand; Bo Thuresson af Ekenstam, both of Molndal; Karl Göran Claeson, Goteborg, and Bror Arne Thalen, Molndal, all of Sweden, assignors to AB Bofors, Bofors, Sweden

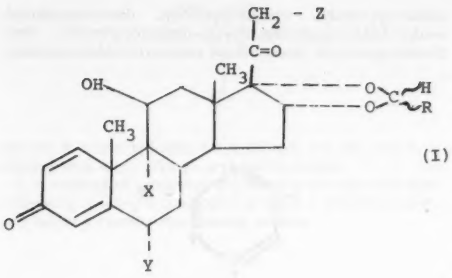
Filed May 14, 1973, Ser. No. 360,051

Claims priority, application Sweden, May 19, 1972, 6644/72

Int. Cl.[2] C07J *17/00*

U.S. Cl. 260—239.55 D **29 Claims**

1. 2′-unsymmetrical-stereoisometric mixtures of 16,17 alkylenedioxy steroids having the general formula:



(I)

wherein X and Y are independently selected from hydrogen and fluorine, X being selected from hydrogen and fluorine when Y is hydrogen and X being fluorine when Y is fluorine, Z is selected from hydroxyl and esterified hydroxyl wherein the hydroxyl group is esterified with a member of the group consisting of phosphoric and sulphuric acids, dicarboxylic acids having 2 – 12 carbon atoms, pyridine-3-carboxylic acid, pyridine-4-carboxylic acid, benzofurane-2-carboxylic acid, and menthoxymethylcarboxylic acid, and lower-alkanoic acids having up to a maximum of 8 carbon atoms, and R is selected from straight and branched hydrocarbon chains having 2 – 10 carbon atoms.

3,929,769

PROCESS FOR THE MANUFACTURE OF STEROID EPOXIDES

Heinz Kaufmann, Fullinsdorf, and Albert Wettstein, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

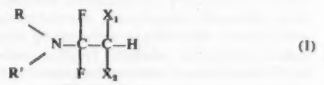
Continuation of Ser. No. 360,230, May 14, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 451,261

Claims priority, application Switzerland, May 19, 1972, 7479/72

Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 R **11 Claims**

1. A process for the manufacture of 5α,6α-steroid epoxides, wherein a 5α,6β-dihydroxy steroid is reacted in an inert organic solvent with an amine of the formula (I)



(I)

in which X_1 represents chlorine or fluorine, X_2 represents chlorine, fluorine or trifluoromethyl group, and R and R′ represent alkyl radicals or together with the nitrogen atom to which they are bonded jointly represent a heterocyclic radical with 5 to 7 ring atoms, and the 5,6 epoxides are isolated.

3,929,770

PROCESS FOR PREPARATION OF STEROID DERIVATIVE

Masayuki Ishikawa; Chikara Kaneko, both of Tokyo; Tatsuo Suda, Tachikawa; Sachiko Yamada, Kawagoe; Yukuo Eguchi, Chiba; Akiko Sugimoto, Hino, and Satoshi Sasaki, Higashiyamato, all of Japan, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

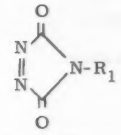
Filed Dec. 3, 1974, Ser. No. 529,140

Claims priority, application Japan, Dec. 3, 1973, 48-134394; Dec. 3, 1973, 48-134395

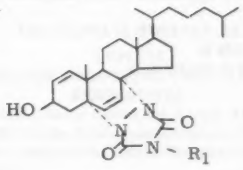
Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 **5 Claims**

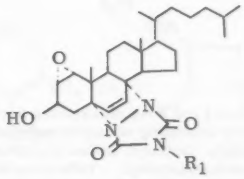
1. A process for the preparation of 1α-hydroxycholecalciferol characterized by reacting cholesta-1,5,7-trien-3β-ol with a triazoline-3,5-dione derivative represented by the following general formula



wherein R_1 represents an alkyl or aryl group, reacting the resulting 1,4-cyclized adduct represented by the following general formula:



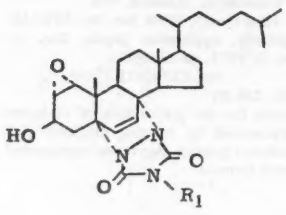
wherein R_1 is defined as above, with a peroxide, reducing the resulting 1α,2α-epoxide compound represented by the following general formula:



wherein R_1 is as defined above, with an alkali metal aluminum hydride, subjecting the resulting cholesta-5,7-diene-1α,3β-

diol to radiation of ultraviolet rays and allowing the resulting 1α,3β-dihydroxyprovitamin D_3 to stand in the dark.

5. The compound having the formula:



where R_1 is defined as above.

3,929,771

NEW REACTIVE DYESTUFFS

Peter William Austin, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

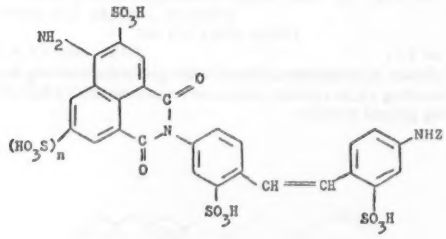
Filed Mar. 21, 1974, Ser. No. 453,634

Claims priority, application United Kingdom, May 9, 1973, 22148/73

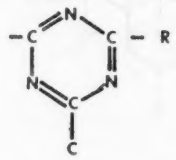
Int. Cl.² C07D 213/46, 211/86

U.S. Cl. 260—240 R 4 Claims

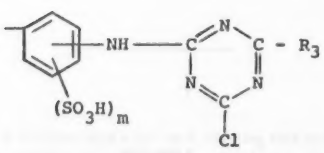
1. A dyestuff of the formula



wherein n is 0 or 1 and Z is a cellulose reactive group selected from the group consisting of sulphatoethylsulphonyl, tetrafluorocyclobutane carbonyl, trifluorocyclobutane carbonyl, tetrafluorocyclobutylacryloyl, trifluorocyclobutyl-acryloyl, dichloroquinoxaline-sulphonyl, dichloroquinoxaline-carbonyl, dichloroquinazoline-sulphonyl, trichloroquinazoline-sulphonyl, dichloroquinazoline-carbonyl, dichlorophthalazine-carbonyl, dichloropyridazonylpropionyl, methanesulphonyl-chloro-methylpyrimidyl, dichloropyridazonylbenzoyl, dichloropyridazonyl-benzene sulphonyl, dibromo-s-triazinyl, dichloropyrimidyl, trichloropyrimidyl, dibromopyrimidyl, methyl-dichloropyrimidyl, cyano-dichloropyrimidyl, nitro-dichloropyrimidyl, lower alkoxy carbonyl-dichloropyrimidyl,



wherein R is Cl, lower alkoxy, phenoxy, sulphophenoxy, sulphonaphthoxy, $-NR_1R_2$ wherein R_1 is H, lower alkyl or CH_2SO_3H and R_2 is H, hydroxy lower alkyl, phenyl, sulphophenyl, disulphophenyl, carboxyphenyl, sulphatoethylsulphonylphenyl, sulpho-carboxyphenyl, sulphotolyl, disulphotolyl, sulphonaphthyl, disulphonaphthyl, methyl-sulphobenzthiazolylphenyl, sulphoindazolyl, or



wherein m is 1 or 2 and R_3 is Cl, NH_2, phenoxy or NHR_4 wherein R_4 is sulphophenyl, tolyl, sulphotolyl, carboxyphenyl, disulphophenyl or sulphonaphthyl.

3,929,772

DYE INTERMEDIATES

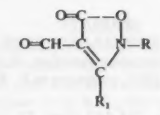
Thomas Dean Weaver, Rochester, N.Y., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed June 4, 1974, Ser. No. 476,318

Int. Cl.² C07D 261/00, 413/14

U.S. Cl. 260—240.4 10 Claims

1. Dye intermediates having the formula



wherein R is selected from alkyl, alkaryl, and aryl and R_1 is selected from alkyl, alkaryl, aryl, and hydrogen.

5. A method of producing quaternated merocyanine dyes comprising reacting a compound of claim 1 with the quaternary salt of a cyanine dye-forming nucleus.

3,929,773

PROCESS FOR PREPARATION OF A PALLADIUM COMPLEX COMPOUND

Takeshi Yamahara, Itami; Takashi Deguchi, Ibaraki, and Shinji Nakamura, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Apr. 5, 1974, Ser. No. 458,416
Claims priority, application Japan, Apr. 5, 1973, 48-39357
Int. Cl.² C07F 15/00
U.S. Cl. 260—242 6 Claims

1. A process for preparation of a palladium complex compound represented by the formula PdL_2X_2, wherein L is a nitrogen-containing heteroaromatic compound and X is a halogen atom, which comprises reacting (A) metallic palladium, (B) a nitrogen-containing heteroaromatic compound selected from the group consisting of pyridine, 2-chloropyridine, 2-bromopyridine, 2-fluoropyridine, 4-phenylpyridine, α-picoline, 5-ethyl-α-picoline, lutidine, 2-vinylpyridine, 2-styrylpyridine, 3-chloropyridine, 2,6-dichloropyridine, 2-chloro-4-methylpyridine, 4-phenylthiopyridine, 2-methoxypyridine, phenyl α-picolinate, methyl α-picolinate, 2,6-dicyanopyridine, α-picolylaldehyde, α-picolinamide, 5,6,7,8-tetrahydroquinoline, 2,2'-dipyridine, quinoline, isoquinoline, 2-chloroquinoline, acridine, phenanthridine, 1,5-naphthyridine, 1,6-naphthyridine, 1,7-naphthyridine, 1,8-naphthyridine, 2,6-naphthyridine, 2,7-naphthyridine, benzo[h]quinoline, benzo[f]quinoline, benzo[g]quinoline, benzo[h-]isoquinoline, benzo[f]isoquinoline, benzo[g]isoquinoline, pyrazine, pyrimidine, pyridazine, quinazoline, phthalazine, quinoxaline, cinnoline, phenazine, polyvinylpyridine and styrene-vinylpyridine copolymer, (C) a halogen compound selected from the group consisting of hydrogen fluoride, hydrogen chloride, hydrogen bromide, hydrogen iodide, aluminum chloride, aluminum bromide, boron chloride, carbon tetrachloride, chloroform, bromoform, phosgene, carbonyl bromide, benzyl chloride, benzyl bromide, benzotrichloride, acetyl chloride, benzoyl chloride, phthaloyl dichloride, silicon tetrachloride, trimethylsilyl chloride, dimethyldichlorosilane, tin tetrachloride, titanium tetrachloride, phosphorus trichloride, phosphorus pentachloride, phosphorus tribromide, phosphorus pentabromide, phosphorus oxychloride, thionyl chloride, thionyl bromide, sulfuryl chloride, tetramethylammonium chloride and tetramethylammonium bromide and (D) an oxygen-containing oxidizing agent, the nitrogen-containing heteroaromatic compound being used in an amount of about 2 to 200 moles per one mole of the metallic palladium, the halogen compound being used in a stoichiometric amount or in excess with respect to the metallic palladium and the oxygen-containing oxidizing agent being used in an equimolar amount or more, in terms of the effective oxygen atom therein, with respect to the metallic palladium.

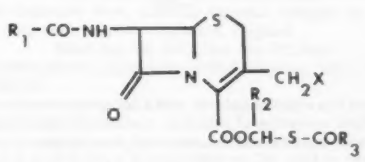
3,929,774

ACYLTHIOMETHYL ESTERS OF CEPHALOSPORINS

Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 277,700, Aug. 3, 1972, Pat. No. 3,860,591. This application Oct. 21, 1974, Ser. No. 516,566
Int. Cl.² C07D 501/24
U.S. Cl. 260—243 C 9 Claims

1. A compound of the formula



wherein R_1 is tetrazolylmethyl or (lower alkyl)tetrazolylmethyl; R_2 is hydrogen or lower alkyl; R_3 is lower alkyl; and X is thiadiazolylthio or (lower alkyl)thiadiazolylthio.

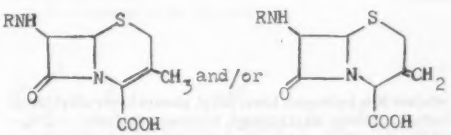
3,929,775

PROCESS FOR PRODUCING CEPHALOSPORIN DERIVATIVES

Michihiko Oshiai, Osaka; Osami Ari, Hyogo; Akira Morimoto, Osaka; Taiiti Okada, Kyoto, and Katsutada Masuda, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

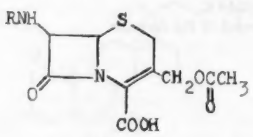
Filed Dec. 3, 1971, Ser. No. 204,771
Claims priority, application Japan, Dec. 8, 1970, 45-109159; Mar. 23, 1971, 46-16726; May 20, 1971, 46-34207
Int. Cl.² C07D 501/02
U.S. Cl. 260—243 C 13 Claims

1. A process for producing a compound of the formula:



wherein R is hydrogen or an acyl group selected from the group consisting of 5-amino-5-carboxyvaleryl, thienylacetyl, phenylglycyl, α-sulfophenylacetyl, pyridylthioacetyl, phenoxyacetyl, 5-methyl-3-phenyl-4-isoxazolylcarbonyl, 1-cyclohex-

enylglycyl, cyanoacetyl, tetrazolylacetyl, β-ethylsulfonylethoxycarbonyl and β-phenylsulfonylethoxycarbonyl, which comprises reacting a compound of the formula:



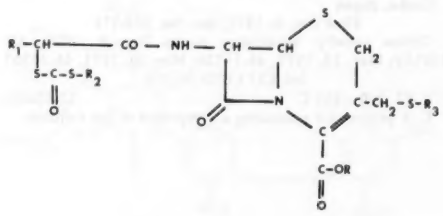
wherein R is as defined above, with a compound selected from the group consisting of chromous acetate, chromous sulfate, chromous chloride and chromous ethylenediamine at a temperature of from 0°C to 100°C and at a pH of from 2 to 8.

3,929,776
3-HETEROTHIO DERIVATIVES OF [(THIOALKOXYCARBONYL)THIOACETYL]CEPHALOSPORINS

Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 10, 1974, Ser. No. 468,727
Int. Cl.² C07D *501/50*; A61K *31/545*
U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula



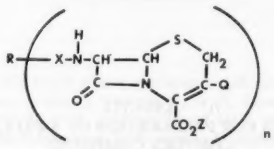
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, benzhydryl, tri(lower alkyl)stannyl, tri(lower alkyl)silyl, $—CH_2—OCO—R_4$, alkali metal, alkaline earth metal, mono(lower alkyl amine) salt or tri(lower alkylamine) salt; R_1 is hydrogen, lower alkyl, phenyl, pyridyl, thienyl or furyl; R_2 is lower alkyl; R_3 is a five membered heterocyclic of the group thiadiazole, triazole, tetrazole and the lower alkyl substituted members of said heterocyclics; and R_4 is lower alkyl, phenyl, phenyl-lower alkyl or benzhydryl; said lower alkyl groups having one to seven carbons.

3,929,777
BIS-CEPHALOSPORINE

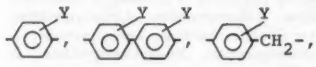
Donald J. Perrella, Princeton Junction, N.J., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

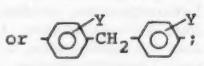
Division of Ser. No. 291,442, Sept. 22, 1972, Pat. No. 3,825,536. This application May 30, 1974, Ser. No. 474,734
Int. Cl.² C07D *501/22*
U.S. Cl. 260—243 C **8 Claims**

1. A compound of the formula

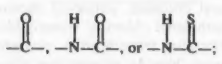


wherein R is





Y is hydrogen, methyl or halogen; X is



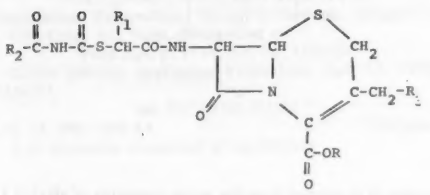
Q is $—CH_3$ or $—CH_2OCOCH_3$; Z is hydrogen, an alkali metal salt, an alkaline earth metal salt, NH_4, alkyl of 1 to 4 carbons, trichloroethyl, pivaloyloxymethyl, benzyl, p-nitrophenyl, trimethylsilyl, trimethylstannyl, methoxymethyl, triethylamine, procaine, dibenzylamine, N-benzyl-β-phenethylamine, N,N-dibenzylethylenediamine, or N-ethylpiperidine; and *n* is 2, 3 or 4.

3,929,778
[(ACYLCARBAMOYL) THIOACETYL] CEPHALOSPORIN DERIVATIVES

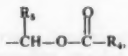
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 8, 1974, Ser. No. 495,597
Int. Cl.² C07D *501/28*; A61K *31/545*
U.S. Cl. 260—243 C 13 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenylmethyl, tri(lower alkyl)silyl,



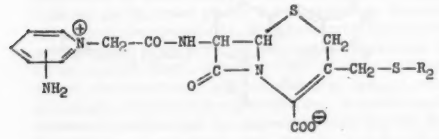
alkali metal, alkaline earth metal, mono(lower alkyl)amine salt or tri(lower alkyl)amine salt; R_1 is hydrogen, lower alkyl, phenyl, thienyl or furyl; R_2 is lower alkyl, lower alkoxy, phenyl, phenyl-lower alkyl or diphenylmethyl; R_3 is hydrogen, hydroxy or lower alkanoyloxy; R_4 is lower alkyl, phenyl, phenyl-lower alkyl or diphenylmethyl; and R_5 is hydrogen or lower alkyl; said lower alkyl, lower alkoxy and lower alkanoyloxy groups having up to seven carbon atoms.

3,929,779
AMINOPYRIDINIUM ACETYL CEPHALOSPORANES

Hans Bickel, Binningen, and Johannes Mueller, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,802
Claims priority, application Switzerland, Apr. 21, 1971, 5768/71; June 16, 1971, 8823/71; Oct. 4, 1971, 14463/71
Int. Cl.² C07D *501/58*
U.S. Cl. 260—243 C 6 Claims

1. Compounds of the general formula I



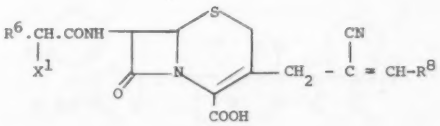
wherein R_2 represents a heterocyclic radical of aromatic character having 5 to 6 ring atoms, bonded via a carbon atom to the sulfur atom and which contains at least 3 nitrogen atoms, said heterocyclic radical being unsubstituted or substituted by lower alkyl, lower alkoxy, lower alkylthio, cyclopentyl, cyclohexyl, unsubstituted phenyl, substituted phenyl, unsubstituted thienyl, substituted thienyl, the substituents of phenyl and thienyl being nitro, halogen, lower alkyl or lower alkoxy and therapeutically acceptable salts of these compounds.

3,929,780
CEPHALOSPORIN COMPOUNDS

Niall Galbraith Weir, London, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed July 18, 1972, Ser. No. 272,945
Claims priority, application United Kingdom, July 1, 1971, 34268/71
Int. Cl.² C07D *501/20*, *501/18*
U.S. Cl. 260—243 C 8 Claims

1. A cephalosporin antibiotic compound of the formula



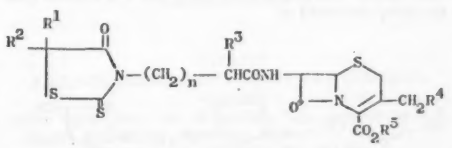
wherein R^6 is phenyl; phenyl mono-substituted by halogen, hydroxy, nitro or amino; thien -2- yl or thein -3- yl; X^1 is hydrogen, amino, hydroxy, (C_1-C_4) alkanoyloxy or carboxy and R^8 is a hydrogen atom or a C_1-C_8 alkyl, cyclopropyl, cyclopentyl or cyclohexyl group or a pharmaceutically acceptable salt thereof.

3,929,781
CERTAIN CEPHALOSPORANIC ACID DERIVATIVES

Daniel M. Teller, Devon, and John H. Sellstedt, Pottstown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed July 25, 1973, Ser. No. 382,436
Int. Cl.² C07D *501/22*, *501/34*
U.S. Cl. 260—243 C 5 Claims

1. A compound of the formula:



in which
R^1 is a member selected from the group consisting of —H,

alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms and aralkyl of 7 to 12 carbon atoms;

R^2 is a member selected from the group consisting of —H and alkyl of 1 to 6 carbon atoms;

R^3 is a member selected from the group consisting of —H and benzyl;

R^4 is a member selected from the group consisting of —H and acetoxy;

R^5 is a member selected from the group consisting of —H, an alkali metal cation and the ammonium cation;

and

n is an integer from 0 to 5, inclusive.

3,929,782

1,2,4-OXADIAZOLONYLACETYL CEPHALOSPORINS

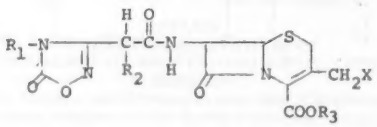
Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 450,929, March 13, 1974, abandoned. This application July 8, 1974, Ser. No. 486,542

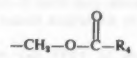
Int. Cl.² C07D *501/20, 499/44*

U.S. Cl. 260—243 C **5 Claims**

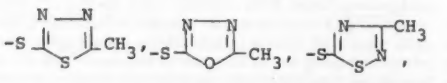
1. A compound of formula:



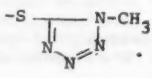
R_1 is selected from the group consisting of hydrogen, lower alkyl and phenyl-lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, hydroxyphenyl, thienyl, furyl, and pyridyl; and R_3 is selected from the group consisting of hydrogen, lower alkyl, phenyl-lower alkyl, benzhydryl, trimethylsilyl, a salt forming ion selected from the group consisting of aluminum, alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine, N-lower alkylpiperidine, and



wherein R_4 is selected from the group consisting of lower alkyl, phenyl, and phenyl-lower alkyl; and X is selected from the group consisting of



and



3,929,783

1-SUBSTITUTED-4-PHENYL-4H-[1,2,4]TRIAZOLO[3,4-C][1,4] BENZOTHIAZINES OR BENZOXAZINES

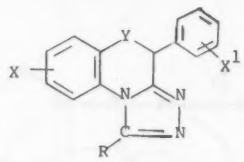
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 6, 1974, Ser. No. 530,123

Int. Cl.² C07D *279/16, 265/28*

U.S. Cl. 260—243 R **10 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of alkyl of 1 to 4 carbons and

X, X^1 and X^2 are independently selected from the group consisting of hydrogen, halogen, trifluoromethyl, alkyl of 1 to 4 carbons and alkoxy of 1 to 4 carbons; and Y is O or S; and the pharmaceutically acceptable acid-addition salts thereof.

3,929,784

2-AMINOALKYL TETRAHYDROQUINOLINES

Hugh Colin Richards, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

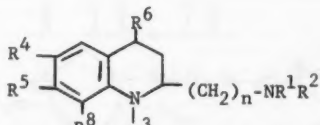
Division of Ser. No. 139,955, May 3, 1971, which is a continuation-in-part of Ser. No. 732,850, May 29, 1968, abandoned. This application Mar. 18, 1974, Ser. No. 451,980

Claims priority, application United Kingdom, June 10, 1967, 26893/67

Int. Cl.² C07D *215/38*

U.S. Cl. 260—247.5 GP **7 Claims**

1. A compound of the formula



and the pharmaceutically accpetable mono-acid addition salts thereof, wherein R^1 and R^2, when taken separately, are each

selected from the group consisting of hydrogen, alkyl having from 1 to 5 carbon atoms, β-hydroxyethyl and cycloalkyl having from 3 to 6 carbon atoms; R^1 and R^2, when taken together, complete a ring selected from the group consisting of pyrrolidino, piperidino and morpholino; R^3 is selected from the group consisting of hydrogen, methyl and ethyl; R^4 is alkoxymethyl having from 1 to 6 carbon atoms in the alkoxy moiety; R^5 is selected from the group consisting of nitro, cyano, fluorine, chlorine and bromine; R^6 is hydrogen or methyl; R^6 is hydrogen or methyl, and n is 1 or 2, and the N-oxides of said base compounds wherein R^1 and R^2, when taken separately, are each other than hydrogen.

3,929,785
POLYCYCLIC N-HETERO DYESTUFFS

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

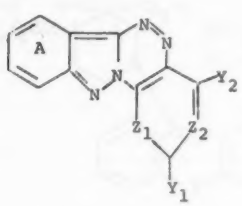
Filed Apr. 8, 1974, Ser. No. 458,924

Claims priority, application Switzerland, Apr. 13, 1973, 5336/73

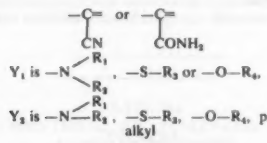
Int. Cl.² C07D *253/08*

U.S. Cl. 260—248 AS **12 Claims**

1. A polycyclic compound of the formula



in which the nucleus A is unsubstituted or substituted by nitro, halo, lower alkyl, lower alkoxy, sulpho, cyano, dimethylaminosulphonyl, diethylaminosulphonyl, methylsulphonyl or ethylsulphonyl; one of Z_1 and Z_2 is -N= and the other is



wherein R_1, R_2, R_3 and R_4 independently represent
hydrogen,
cyclohexyl,
allyl,
phenyl, unsubstituted or substituted by lower alkyl, lower alkoxy, halo or sulpho;
napthyl,
or
alkyl of up to 12 carbon atoms which is unsubstituted or substituted by lower alkoxy, napthyl, phenyl or phenyl substituted by lower alkoxy, lower alkyl, halo or sulpho; hydroxy, nitrile, lower alkoxy, 2-hydroxyethoxy, furanyl-(2)-, tetrahydropyranyl-(2)-, acyloxy wherein acyl represents alkanoyl of up to 5 carbon atoms, alkylcarbamyl of up to 5 carbon atoms, alkoxycarbamyl of up to 5 carbon atoms, phenylcarbamyl, phenoxycarbonyl, benzoyl, phenoxyacetyl, chloroacetyl or phenylacetyl; N-pyrollidonyl, diloweralkylamino and the quaternary salts thereof, the N-pyridinium quaternary salt, the N-(N-N-dimethyl) hydrazinium quaternary salt, the N-morpholino, N-ethoxycarbonylethyl quaternary ammonium salt, the N-(N,N-pentamethylene) hydrazinium quaternary salt, the N-ethyl pyridinium-(4)-quaternary salt, or the 1-(N-pyridinium) acetoxy quaternary ammonium salt; or

together with R_1 and R_2 represent represent pyrrolidono, piperdino, morpholino, piperazino, N'-methylpiperazino, N'-ethylpiperazino, N-thiomorpholino-S-dioxide, N'-acetylpiperazino or the N',N'-dimethylpiperazine quaternary salt.

3,929,786
S-SUBSTITUTED HYDROPYRIMIDINE COMPOUNDS

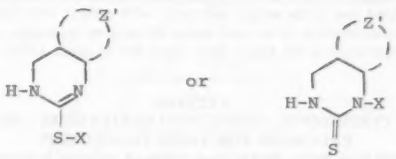
Donald O. Rickter, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 214,665, Jan. 3, 1972, Pat. No. 3,785,813. This application Oct. 1, 1973, Ser. No. 402,130

Int. Cl.² C07D *239/70, 239/78;* **G03C** *1/40, 1/48*

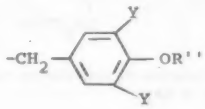
U.S. Cl. 260—251 A **5 Claims**

1. A compound having the formula:



wherein Z' is an ortho-fused cyclopenta or cyclohexa group; X is hydrogen or an alkaline hydrolyzable group represented by the formula:

wherein R' is an alkyl group having from 1 to 20 carbon atoms; phenyl; p-hydroxyphenyl or o-hydroxyphenyl; or by the formula:



wherein Y is hydrogen, t-butyl or chloro, and R'' is hydrogen, acetyl or propionyl.

3,929,787
6,7,8,9-TETRAHYDRO-PYRIDO(1,2-A)PYRIMIDIN-4-ONES

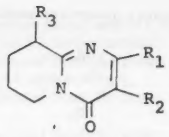
Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 22, 1974, Ser. No. 462,899

Int. Cl.² C07D *471/04*

U.S. Cl. 260—251 A **5 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof, wherein R_1 is phenyl or phenyl substituted with alkyl, alkoxy, halogen or trifluoromethyl in one or two positions; R_2 is hydrogen or alkyl; and R_3 is alkyl; wherein alkyl and alkoxy are groups having 1 to 3 carbon atoms.

3,929,788

SYNTHESIS OF 4,5-DIAMINOURACIL AND ITS SALTS

Richard C. Miller, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed July 2, 1973, Ser. No. 375,426

Int. Cl.² C07D *239/10*

U.S. Cl. 260—256.4 C **12 Claims**

1. A process for preparing 4,5-diaminouracil or its sulfate salts comprising the step of reacting an acetate derivative of 4,5-diaminouracil, whose acetate substituents are attached to at least one of the amino nitrogens, with sulfuric acid having a concentration of at least about 80 percent by weight at a temperature in the range from about 90° to about 120°C.

3,929,789

PYRIMIDINYL ACETIC ACID DERIVATIVES AND PROCESSES FOR THEIR PRODUCTION

David Rees Parry, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

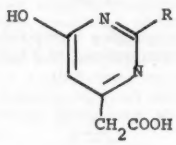
Filed Dec. 26, 1973, Ser. No. 428,315

Claims priority, application United Kingdom, Jan. 8, 1973, 964/73

Int. Cl.² C07D *239/36*

U.S. Cl. 260—256.4 C **4 Claims**

1. A pyrimidine derivative of the formula:



wherein R is alkylamino or dialkylamino wherein the alkyl moiety is methyl or ethyl.

3,929,790

ALKYLATION OF IODININ

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 818,448, April 22, 1969, abandoned. This application Dec. 4, 1972, Ser. No. 312,095

Int. Cl.² C07D *241/46*

U.S. Cl. 260—267 **10 Claims**

1. A process for converting 1,-6-dihydroxyphenazine 5,10-dioxide to a 1-hydroxy-6-lower alkoxyphenazine 5,10-dioxide comprising the steps of

a. reacting at a temperature of from about 5°C. to about 35°C. 1,6-dihydroxyphenazine 5,10-dioxide with about an equimolar amount of an alkali metal lower alkoxide in hexamethylphosphoric triamide to form the mono-alkali metal salt,

b. reacting the salt thus formed in the hexamethylphosphoric triamide and at the same temperature with from about 1 to about 2 moles of an alkylating agent per mole of the salt, wherein the alkyl group of the alkylating agent contains from 1 to 7 carbon atoms and

c. recovering 1-hydroxy-6-lower alkoxyphenazine 5,10-dioxide.

3,929,791

2 SUBSTITUTED-10[4-(2-OXAZOLIDI NONE-LOWER ALKYL)]-PIPERAZINE-DIBENZO[B,F]THIEPINS

Max Gerecke, Reinach; Jean-Pierre Kaplan, Bubendorf, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

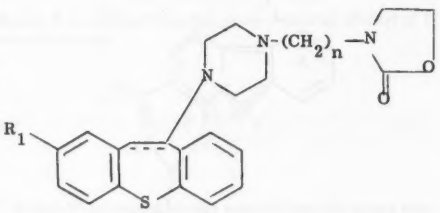
Filed July 12, 1973, Ser. No. 378,730

Claims priority, application Switzerland, July 21, 1972, 1101/72, May 17, 1973, 7059/73

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 TR **9 Claims**

1. A compound of the formula



wherein *n* stands for 2 or 3, R_1 is halogen, lower alkyl, di(lower alkyl)sulfamoyl, nitro, amino, di(lower alkyl-)amino or trifluoromethyl, and wherein the bond indicated by the broken line is hydrogenated or forms a double bond,

or a pharmaceutically acceptable acid addition salt thereof.

3,929,792

PHENYLPIPERAZINE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND APPLICATIONS THEREOF

D. Emile Bouchara, 75 bis, Avenue Foch, 75016 Paris, France

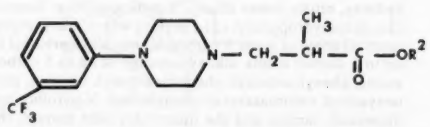
Filed Sept. 17, 1973, Ser. No. 397,769

Claims priority, application France, Sept. 29, 1972, 72.34476

Int. Cl.² C07D *295/10*

U.S. Cl. 260—268 PH **5 Claims**

1. A compound of the formula



in which R^2 is a radical selected from the group consisting of hydrogen, lower alkyl, allyl, propargyl, phenyl (lower) alkyl

and 3-[4-(m-trifluoromethylphenyl)-1-piperazinyl]-2-methylpropyl, or its salts with therapeutically acceptable acids and bases.

3,929,793
CERTAIN PIPERAZINE-CONTAINING INDOLE COMPOUNDS

Alfred Popelak, Rimbach; Wolfgang Kampe, Heddesheim; Max Thiel, Mannheim; Karl Dietmann, Mannheim-Vogelstang, and Gisbert Sponer, Hemsbach, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

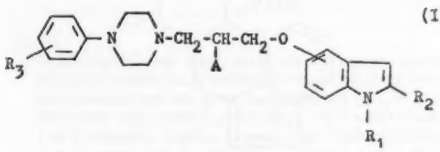
Filed June 28, 1974, Ser. No. 484,354

Claims priority, application Germany, July 24, 1973, 2337461

Int. Cl.² C07D *241/04*

U.S. Cl. 260—268 BC **19 Claims**

1. Indole compound of the formula:



(I)

wherein

R_1 is hydrogen or alkyl;

R_2 is hydrogen, alkoxycarbonyl or carboxyl;

R_3 is hydrogen, halogen, alkyl, alkoxy or alkylthio; and

A is hydrogen or hydroxyl;

wherein the alkyl moieties contain no more than six carbon atoms each;

and the pharmacologically acceptable salts thereof.

3,929,794
UNSYMMETRICAL BISAZOMETHINE METAL COMPLEX PIGMENTS

James McGeachie McCrae, Stewarton, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

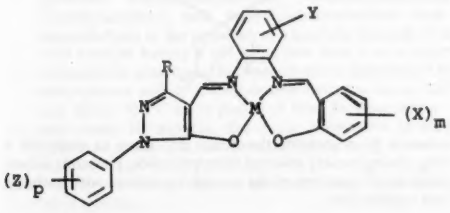
Filed Sept. 18, 1973, Ser. No. 398,528

Claims priority, application United Kingdom, Sept. 20, 1972, 43451/72

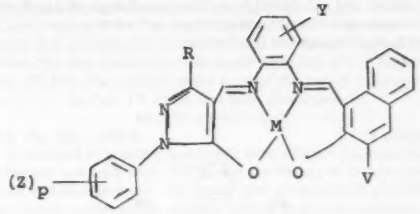
Int. Cl.² C07D *231/20, 215/22*

U.S. Cl. 260—270 **17 Claims**

1. A compound of the formula

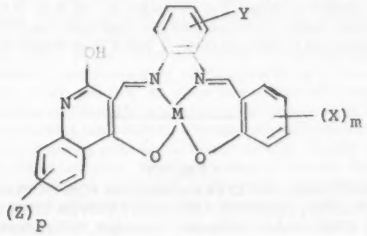


or

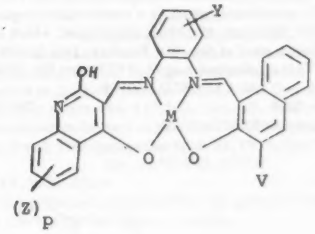


wherein Y is hydrogen, nitro, methyl or chloro; M is a transition metal atom; X is hydrogen, nitro, methyl, chloro or hydroxy; *m* is an integer of 1 to 4; Z is hydrogen, nitro, methyl, chloro or hydroxy; *p* is an integer of 1 to 4; R is hydrogen, nitro, methyl, chloro or hydroxy; and V is hydrogen or carboxy.

9. A compound of the formula

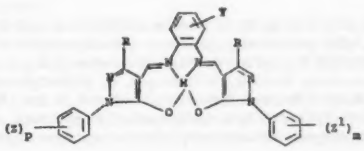


or



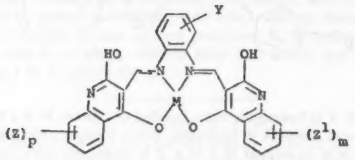
wherein Y is hydrogen, nitro, methyl or chloro; M is a transition metal atom; Z^1 is hydrogen, nitro, methyl, chloro or hydroxy; *m* is an integer of 1 to 4; X is hydrogen, nitro, methyl, chloro or hydroxy; *p* is an integer of 1 to 4; and V is hydrogen or carboxy.

12. A compound of the formula



wherein Y is hydrogen, nitro, methyl or chloro; M is a transition metal atom; Z is hydrogen, nitro, methyl, chloro or hydroxy; p is an integer of 1 to 4; Z^1 is hydrogen, nitro, methyl or chloro and is different from Z; m is an integer of 1 to 4; and R is hydrogen, nitro, methyl, chloro or hydroxy.

15. A compound of the formula



wherein Y is hydrogen, nitro, methyl or chloro; Z is hydrogen, nitro, methyl or chloro; p is an integer of 1 to 4; Z^1 is hydrogen, nitro, methyl or chloro; and Z^1 is hydrogen, nitro, methyl or chloro and is different from Z; and n is an integer of 1 to 4.

3,929,795

PROCESSES AND INTERMEDIATES FOR QUININE, QUINIDINE, ISOMERS AND DERIVATIVES THEREOF

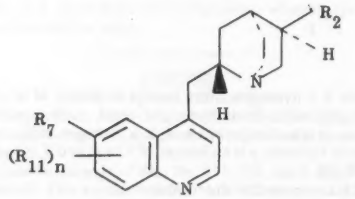
Juerg Albert Walter Gutzwiller, Bettingen, Switzerland, and Milan Radoje Uskokovic, Upper Montclair, N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 212,774, Dec. 27, 1971, Pat. No. 3,772,302, which is a continuation-in-part of Ser. No. 104,784, Jan. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 837,354, June 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 741,914, July 2, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,525

Int. Cl.² C07D *453/04*

U.S. Cl. 260—284 **20 Claims**

1. A compound of the formula



wherein n is 0 to 2; R_2 is vinyl or ethyl; R_{11} is hydrogen, methyl, ethyl, propyl, butyl, methoxy, trifluoromethyl, chloro or, when n is 2, R_{11}, taken together with an adjacent R_{11}, is also methylenedioxy; when R_{11} is hydrogen, R_7 is methyl, ethyl, propyl, butyl, trifluoromethyl or chloro; when R_{11} is other than hydrogen and n is 1, R_7 is methyl, ethyl, propyl, butyl, methoxy, hydrogen, trifluoromethyl, chloro or, taken together with an adjacent R_{11}, is methylenedioxy; and when R_{11} is other than hydrogen and n is 2, R_7 is hydrogen, its antipode or racemate.

3,929,796

SYNTHESIS OF PENNICLAVINE AND ELYMOCLAVINE

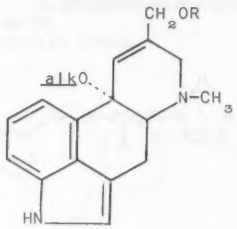
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 2, 1974, Ser. No. 494,147

Int. Cl.² C07D *457/02*

U.S. Cl. 260—285.5 **2 Claims**

1. A compound of the formula



wherein alk is (C_1–C_3) alkyl and R is H or CO-alk, said alk groups being the same or different.

3,929,797

PHOTOGRAPHIC PROCESSES AND PRODUCTS EMPLOYING 8-QUINOLINOL PHTHALEINS AS OPTICAL FILTER AGENTS

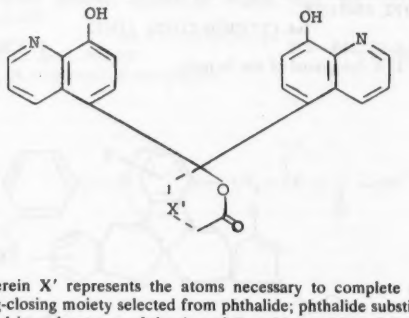
Alan L. Borror, Lexington, and Paulina P. Garcia, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 202,483, Nov. 26, 1971, Pat. No. 3,816,123. This application Mar. 25, 1974, Ser. No. 454,692

Int. Cl.² C07D *215/32*

U.S. Cl. 260—287 CE **10 Claims**

1. An indicator dye of the formula:



wherein X′ represents the atoms necessary to complete a ring-closing moiety selected from phthalide; phthalide substituted in at least one of the 4- and 7-positions with carboxy; and naphthalide.

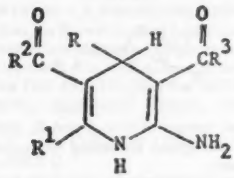
3,929,798

2-AMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 336,639, Feb. 28, 1973, Pat. No. 3,867,393. This application Feb. 1, 1974, Ser. No. 438,603
Claims priority, application Germany, Mar. 6, 1972, 221067
Int. Cl.² C07D *215/32*
U.S. Cl. 260—287 K 43 Claims

1. A compound of the formula:



wherein

R is hydrogen; lower alkyl; lower alkenyl; lower alkynyl; phenyl unsubstituted or substituted by one to three members selected from the group consisting of 1 to 3, monter-tiary lower alkyl, tertiary lower alkyl, 1 to 3 lower alkoxy, 1 to 3 halogeno, 1 nitro, 1 cyano, 1 to 3 trifluoromethyl, 1 to 3 aziod, 1 to 3 carbo(lower alkoxy), 1 to 3 lower alkylsulfonyl, 1 to 3 lower alkylsulfinyl, 1 to 3 lower alkylthio and 1 to 3 phenyl moieties; or naphthyl;

R^1 and R^2 are linked together and are alkylene of 2 to 4 carbon atoms; and

R^3 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino.

3,929,799

PROCESS FOR PRODUCING VINYL PYRIDINE COMPOUNDS

Helmut Eugen Thyret, Munich, Germany, assignor to Consortium fur Elecktrochemische Industrie GmbH, Munich, Germany

Filed Jan. 20, 1971, Ser. No. 108,138
Claims priority, application Germany, Jan. 22, 1970, 2002661
Int. Cl.² C07D *313/06*, *215/06*, *217/02*, *219/02*
U.S. Cl. 260—290 V 4 Claims

1. Process for the direct conversion in a single stage of an alkyl pyridine to the corresponding vinyl pyridine, consisting essentially of the steps of:

a. contacting an alkyl pyridine selected from the group consisting of 2-methylpyridine, 4-methylpyridine, 2,4-lutidine, 2,6-lutidine, 2,4,6-collidine, 2,3,6-collidine, 2-methyl-5-ethylpyridine, 2-methylquinoline, 4-methylquinoline, 1-methylisoquinoline, 3-methylisoquinoline, 9-methylacridine, and 9-methylphenanthridine with formaldehyde in the presence of a catalytic amount of an acid catalyst having a pH value less than 5 at a superatmospheric pressure of between about 30 and about 100 atmospheres and at a temperature between about 200° and about 300°C for a period of time between about 2 and about 10 minutes, the molar proportion of alkyl pyridine compound to formaldehyde being between about 2:1 and about 5:1, and

b. rapidly cooling the mixture and recovering the resulting vinyl pyridine.

3,929,800

POLYMER GRAFTING ONTO HYDROCARBON LIQUIDS

Carl Horowitz, Brooklyn, N.Y., assignor to Polymer Research Corporation of America, Brooklyn, N.Y.

Continuation of Ser. No. 888,905, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 834,489, June 18, 1969, Pat. No. 3,698,931. This application July 27, 1972, Ser. No. 275,672. The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.
Int. Cl.² C07C *69/52*
U.S. Cl. 260—290 R 3 Claims

1. Method of grafting a polymer onto a liquid hydrocarbon molecule selected from the group consisting of polypropylenes, polyisobutylenes, dipentene and postpyrolytic gasoline in a liquid hydrocarbon medium which comprises contacting said liquid hydrocarbon molecule in said liquid hydrocarbon medium with a solution of a soluble silver salt in an amount of about 0.0001 – 0.01 percent by weight, said solution thus containing silver ions, and also containing a polymerizable composition consisting essentially of a solution in a solvent selected from the group consisting of dimethylformamide, tetrahydrofurane, tetrahydrofurfuryl alcohol, dimethylsulfoxide, water, methyl alcohol, ethyl alcohol, isopropyl alcohol, acetone, methyl ethyl ketone, ethyl acetate and mixtures thereof of a per-catalyst selected from the group consisting of ammonium persulfate, hydrogen peroxide, tert-butylhydroperoxide, ditertbutyl peroxide, benzoyl peroxide, dicumyl peroxide, lauroyl peroxide, tert-butylperbenzoate and peracetic acid and a polymerizable monomer in an amount of 0.1 – 50 percent by weight which is activated to polymerization by activation of said percatalyst, said catalyst being activated by metallic silver, whereby the silver ions of said silver salt are reduced by said liquid hydrocarbon molecule to metallic silver which activates said catalyst, whereby polymerization occurs and the resulting polymer is bound directly to said liquid hydrocarbon molecule, thereby forming an intimate bonding of the polymer to said liquid hydrocarbon molecule in said liquid hydrocarbon medium, thus obtaining a liquid hydrocarbon composition with properties different from those of the original liquid hydrocarbon.

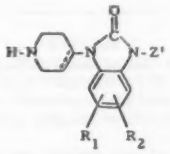
3,929,801

2-BENZIMIDAZOLINONES

Paul Adriaan Jan Janssen, Vosselaar; Ineke van Wijngaarden, Beerse, and Willem Soudijn, Turnhout, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 417,702, Nov. 20, 1973, which is a continuation-in-part of Ser. No. 321,058, Jan. 4, 1973, abandoned. This application Sept. 25, 1974, Ser. No. 515,136
Int. Cl.² C07D *401/04*
U.S. Cl. 260—293.6 7 Claims

1. A compound selected from the group of benzimidazolinone derivatives having the formula



wherein:

Z′ is a member selected from the group consisting of lower alkenyl, phenoxy-loweralkyl, phenyl-loweralkyl, di-loweralkyl-aminoloweralkyl and cyclic loweralkyleneamino-loweralkyl;

R_1 and R_2 are each a member selected from the group consisting of hydrogen, halo and loweralkyl; and

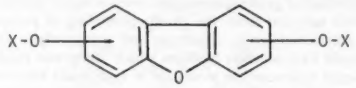
the dotted line indicates an optional double bond.

3,929,802
BIS-BASIC ETHERS OF DIBENZOFURAN

William L. Albrecht, and Robert W. Fleming, both of cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

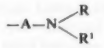
Continuation of Ser. No. 45,578, June 11, 1970, abandoned. This application Feb. 25, 1974, Ser. No. 446,194
Int. Cl.[2] C07D *307/91*
U.S. Cl. 260—293.58 13 Claims

1. A compound selected from a base of the formula



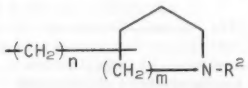
wherein each X is a member selected from the group consisting of

A. the group



wherein each A is an alkylene chain having from 2 to 6 carbon atoms and which separates the amino nitrogen and [Y] the ether oxygen by at least 2 carbon atoms; R and R^1 are individually selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl of from 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group; or each set of R and R^1 taken together with the nitrogen atom to which they are attached is a saturated monocyclic heterocyclic group selected from pyrrolidino, piperidino, morpholino, or N-(lower)alkylpiperazino;or

B. the group



wherein *n* is a whole integer of from 0 to 2, *m* is 1 or 2, and R^2 is a member selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, or alkenyl of 3 to 6 carbon atoms and having the vinyl unsaturation in other than the 1-position of the alkenyl group;

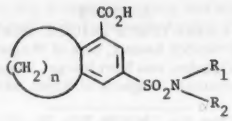
or a pharmaceutically acceptable acid addition salt of said base.

3,929,803
ARYL CARBOXYLIC ACIDS

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 28, 1974, Ser. No. 473,742
Int. Cl.[2] C07D *295/22*
U.S. Cl. 260—293.62 7 Claims

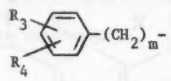
1. A compound selected from those of the formula



and the pharmaceutically acceptable basic salts thereof wherein

R_1 is selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms;

R_2 is selected from the group consisting of alkyl having 1 to 4 carbon atoms and



wherein *m* is an integer of 0 to 3 and R_3 and R_4 are each selected from the group consisting of hydrogen, methyl, chloro and bromo;

R_1 and R_2 when considered together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of morpholino, hexamethyleneimino, piperidino and mono- and dimethylpiperidino; and

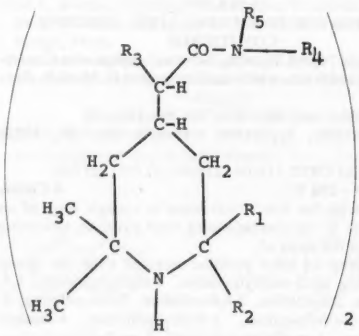
n is an integer of 3 to 5.

3,929,804
4-PIPERIDINE ACETAMIDE COMPOUNDS

Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 17, 1973, Ser. No. 380,043
Claims priority, application United Kingdom, July 28, 1972, 35488/72
Int. Cl.[2] C07D *211/30*
U.S. Cl. 260—293.63 6 Claims

1. A compound of the formula



I

wherein

R_1 and R_2 are the same or different and each is a straight- or branched alkyl residue having from 1 to 12 carbon atoms or R_1 and R_3, together with the carbon atom to which they are attached, form a cycloalkyl group having from 5 to 12 carbon atoms,

R_3 and R_5 is independently hydrogen, a straight- or branched alkyl residue having from 1 to 4 carbon atoms, or aralkyl residue selected from benzyl, α- methylbenzyl

or α-, p-dimethylbenzyl, or a cycloalkyl group having 5 or 6 carbon atoms,

R_4 is a divalent hydrocarbyl residue having from 2 to 20 carbon atoms and being either unsubstituted or substituted by halogen or interrupted by one or more oxygen or sulphur atoms, or a salt of the amine function thereof.

3,929,805

CERTAIN 4H-(2,3D)PYRIDO-1,3,2-DIOXAPHOSPHORINANES

Daniel Pillon; Jacques Ducret, both of Lyon, and Daniel Demozay, Villeurbanne, all of France, assignors to Pepro, Societe pour le Developement et la Vent de Specialities, Lyon, France

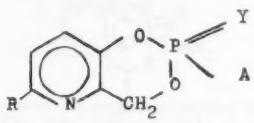
Filed Oct. 13, 1972, Ser. No. 297,316

Claims priority, application France, Oct. 20, 1971, 71.38520

Int. Cl.² C07D *213/62*

U.S. Cl. 260—294.8 C **4 Claims**

1. A chemical derivative of phosphorus corresponding to the following general formula:



in which

R represents hydrogen or a methyl radical,

A represents a halogen, alkyl, phenyl alkoxy, alkoxy-alkoxy or alkylthio radical, the alkyl portion of the aforementioned radicals containing from 1 to 4 carbon atoms, and

Y represents oxygen or sulphur.

3,929,806

ISOTHIOCYANOPYRIDINE DERIVATIVES

Wolfgang Schmid, Therwil; Ernst Gutzwiller, Rheinfelden, and Urs Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

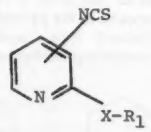
Filed Aug. 8, 1973, Ser. No. 386,796

Claims priority, application Switzerland, Aug. 10, 1972, 11886/72; Aug. 10, 1972, 11887/72

Int. Cl.² C07D *213/74*

U.S. Cl. 260—294.8 E **4 Claims**

1. A compound of the formula



wherein

the -NCS group is in the 3- or 5- position

R_1 is alkyl of from 1 to 10 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, or cyclopropylmethyl, and

X is oxygen or sulphur.

3,929,807

2-SUBSTITUTED-4(5)-(ARYL)-5(4)-(2,3 OR -4-PYRIDYL)-IMIDAZOLES

Konrad Fitzi, Neuallschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

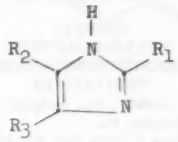
Continuation of Ser. No. 247,431, April 25, 1972, abandoned. This application June 3, 1974, Ser. No. 475,473

Claims priority, application Switzerland, Mar. 22, 1972, 4250/72

Int. Cl.² C07D *213/38*

U.S. Cl. 260—294.8 R **10 Claims**

1. A compound of the formula



wherein R_1 represents isopropyl, sec. butyl, tert. butyl or p-chlorophenyl, one of the groups R_2 and R_3 represents unsubstituted phenyl or phenyl substituted in the para position by methoxy, and the other represents an unsubstituted 2-, 3- or 4-pyridyl group, or a pharmaceutically acceptable acid addition salt thereof.

3,929,808

PYRIDYL PHENYL-CARBAMATE RODENTICIDE

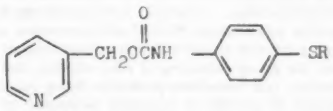
Edward E. Kilbourn, Chalfont, and Ernest D. Weiler, Ambler, both of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Filed Dec. 28, 1973, Ser. No. 429,464

Int. Cl.² C07D *213/75*

U.S. Cl. 260—294.8 G **5 Claims**

1. A compound of the structure



wherein R is

a. hydrogen

b. allyl

c. CN

d. CCl_3 or

e. 5-tetrazolyl

and its acid salts.

3,929,809

OXAZOLO-[4,5-B]-PYRIDINE-2-ONES AND -2-THIONES AS INTERMEDIATES

Haukur Kristinsson, Bottmingen, and Kürt Rüfenacht, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

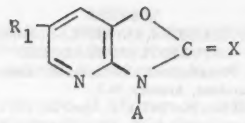
Continuation of Ser. No. 435,066, Jan. 21, 1974, abandoned, which is a division of Ser. No. 156,983, June 25, 1971, Pat. No. 3,808,218, which is a continuation-in-part of Ser. No. 155,604, June 22, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,787

Claims priority, application Switzerland, June 26, 1970, 9702/70

Int. Cl.² C07D *213/44*

U.S. Cl. 260—294.8 C **17 Claims**

1. An oxazolo[4,5-b]pyridine compound of the formula III



(III)

wherein

A represents a halogenomethyl, the vinyl or a 1,2-dihalogenoethyl group,

R_1 is hydrogen, halogen or nitro, and

X represents oxygen or sulphur.

3,929,810

3-PYRIDYLMETHYL N-(4-CYANOMETHYLPHENYL)-CARBAMATE AND DERIVATIVES

Ernest D. Weiler, Ambler, Pa., assignor to Rohm & Haas Company, Philadelphia, Pa.

Filed June 3, 1974, Ser. No. 475,709

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 **5 Claims**

1. The compound 3-pyridylmethyl N-(4-cyanomethylphenyl)carbamate and an acid addition salt thereof.

3,929,811

PRODUCTION OF PYRIDINE NITRILES AND CARBOXYLIC ACIDS

Abraham P. Gelbein, Plainfield; Morgan C. Sze, Upper Montclair, and John E. Paustian, Whippany, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 415,991, Nov. 15, 1973, abandoned. This application Apr. 25, 1974, Ser. No. 463,882

Int. Cl.² C07D *213/79*

U.S. Cl. 260—295.5 R **23 Claims**

1. A process for producing nicotinic acid, comprising:

a. contacting in a nitrile production zone a member selected from the group consisting of 2,3-picoline, 2,3-and 2,5-dimethylpyridine, 2-methyl, 5-ehtylpyridine, 2,3-ethylpyridine and mixtures thereof with ammonina and vanadium pentoxide supported on a porous support selected from the group consisting of silica-alumina and gamma-alumina, said vanadium pentoxide being present in an amount to provide a vanadium pentoxide to support weight ratio ranging from about 0.3:1 to about 3:1 substantially entirely eithin the pores of the support, said vanadium pentoxide having been placed in molten form substantially within the pores of a support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said contacting being effected in the absence of molecular oxygen;

b. withdrawing a gaseous effluent from the nitrile production zone;

c. separating organic components from the gaseous effluent, said organic components including nicotinonitrile, unreacted feed and organic intermediates;

d. introducing the separated organic components into a separation zone to separate nicotinonitrile from unreacted feed and organic intermediates;

e. recycling the unreacted feed and organic intermediates to the nitrile production zone;

f. combining separated nicotinonitrile with ammonia and an aqueous recycle containing nicotinoamide and ammonium nicotinate;

g. heating the combined streams to a temperature of from 200°F to about 450°F to effect hydrolysis of the nicotinonitrile and nicotinamide to ammonium nicotinate;

h. heating the ammonium nicotinate to effect decomposition thereof to nicotinic acid, said decomposition being effected with continuous removal of evolved ammonia;

i. recovering a product stream containing nicotinic acid and an aqueous solution of ammonium nicotinate and nicotinamide;

j. separating nicotinic acid from the aqueous solution; and

k. employing the aqueous solution of ammonium nicotinate and nicotinamide as said aqueous recycle.

3,929,812

DERIVATIVES OF 1H-TRIAZOLO [4,5-C]PYRIDINE-7-CARBOXYLIC ACIDS AND ESTERS

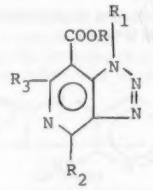
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 20, 1974, Ser. No. 471,537

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 B **10 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R_2 is lower alkoxy or

wherein R_4 is hydrogen, lower alkyl, di(lower alkyl)amino(-lower alkyl) or phenyl and R_5 is hydrogen or lower alkyl; and R_3 is hydrogen, lower alkyl or phenyl.

3,929,813

NOVEL PRO-DRUG DERIVATIVES OF PYRIDINIUM ALDOXIME TYPE CHOLINESTERASE REACTIVATORS AND PROCESS FOR PREPARING SAME

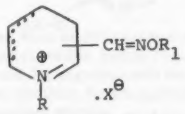
Takeru Higuchi; Nicolae S. Bodor, and Efraim Shek, all of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Filed Dec. 26, 1973, Ser. No. 428,215

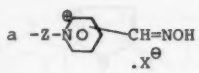
Int. Cl.² C07D *211/26*

U.S. Cl. 260—296 M **22 Claims**

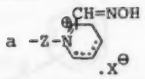
1. A pro-drug compound of the pyridine aldoxime (hydroxyiminomethyl pyridinium) type capable of reactivating blocked cholinesterase having the formula:



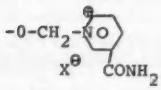
wherein R represents a member selected from the group consisting of an alkyl (C_1-C_4) group,



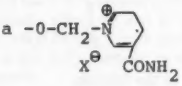
group,



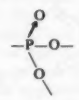
group,



group, and



wherein Z represents a member selected from the group consisting of a $-CH_2-CH_2-$ group, a $-CH_2-O-CH_2-$ group, a $-CH_2CH_2OCH_2CH_2-$ group, and a $-CH_2O-CH_2-CH_2-O-CH_2-$ group; wherein R_1 represents a member selected from the group consisting of a hydrogen atom, a methyl group, an acyl group and a



group; and wherein X^- represents an anion derived from a pharmaceutically acceptable acid addition salt.

3,929,814

(OXADIAZOLYL) ALKYL) BENZIMIDAZOLES

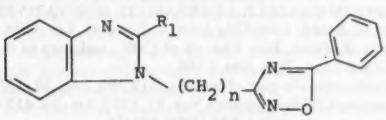
Venkatachala L. Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 1, 1974, Ser. No. 456,707

Int. Cl.² C07D *271/06*

U.S. Cl. 260—302 H **7 Claims**

1. A compound having the structure



or a pharmaceutically acceptable acid-addition salt thereof wherein R_1 is hydrogen or thiazolyl and *n* is an integer of from 2 to 6.

3,929,815

HYDROXY-, ALKOXY-, AND ALKYLCARBAMOYLOXY-,1-BENZISOTHIAZOLES

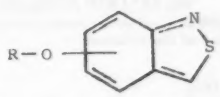
Gary M. Singerman, Prairie Village, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 19, 1973, Ser. No. 426,118

Int. Cl.² C07D *275/04*

U.S. Cl. 260—304 A **8 Claims**

1. A compound having the general formula



where R is N-lower alkylcarbamoyl or N,N-di-lower alkylcarbamoyl.

3,929,816

HERBICIDAL THIADIAZOLYL-UREAS

Paul Rathgeb, Basel; Christian Vogel, Binningen, and Anton G. Weiss, Benken, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 842,023, July 15, 1969, abandoned. This application June 28, 1974, Ser. No. 484,047

Claims priority, application Switzerland, July 17, 1968, 10691/68

Int. Cl.² C07D *285/12*

U.S. Cl. 260—306.8 D **3 Claims**

1. N-[5-(2′-chloroallylthio)-1,3,4-thiadiazolyl-(2)]-N′-methylurea.

2. N-[5-(2′-chloroallylthio)-1,3,4-thiadiazolyl-(2)]-N,N′-dimethylurea.

3. N-[5-(2′-chloroallylthio)-1,3,4-thiadiazolyl-(2)-N′,N′-dimethylurea.

3,929,817

DITHIOPHOSPHORIC ACID ESTERS

Jozef Drabek, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

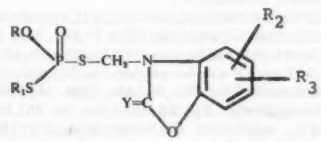
Filed Sept. 22, 1972, Ser. No. 291,494

Claims priority, application Switzerland, Sept. 28, 1971, 14157/71; July 25, 1972, 11112/72

Int. Cl.² C07D *263/58, 277/68, 277/70*

U.S. Cl. 260—307 C **13 Claims**

1. A compound of the formula



wherein

R is methyl or ethyl,

R_1 is n-pentyl or ethoxyethyl,

each of R_2 and R_3 is hydrogen or halogen, and

Y is oxygen or sulphur.

3,929,818
TETRAZOLYL DERIVATIVES OF NATURALLY OCCURRING PROSTAGLANDINS

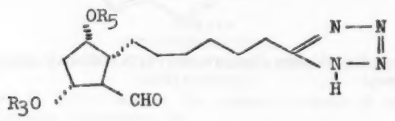
Hans-Jurgen E. Hess, Old Lyme; Leonard J. Czuba, New London, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 335,586, Feb. 26, 1973, Pat. No. 3,883,513, which is a continuation-in-part of Ser. No. 177,102, Sept. 1, 1971, abandoned. This application Aug. 27, 1974, Ser. No. 500,944

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D 1 Claim

1. A compound of the structure:



wherein R_3 is hydrogen or 2-tetrahydropyranyl; and R_5 is hydrogen, alkanoyl having from 1 to 5 carbon atoms, benzoyl, p-phenylbenzoyl, or α- or β-naphthoyl.

3,929,819
UROCANIC ACID AMIDE DERIVATIVES

Shinichi Inazuka, Tokyo, and Sadayoshi Ninagawa, Yokohama, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

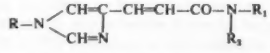
Filed Oct. 26, 1973, Ser. No. 410,178

Claims priority, application Japan, Nov. 1, 1972, 47-109665

Int. Cl.² C07D *233/64*

U.S. Cl. 260—309 7 Claims

1. A compound which is an amide of the formula



or a cosmetically acceptable acid addition salt thereof, in said formula R being hydrogen, alkyl of 1 to 22 carbon atoms or alkanoyl of 2 to 22 carbon atoms, R_1 and R_2 being hydrogen or alkyl or hydroxyalkyl each of up to 18 carbon atoms.

3,929,820
PROCESS FOR THE PRODUCTION OF N-TRITYLIMIDAZOLES

Karl-Heinz Büchel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Germany

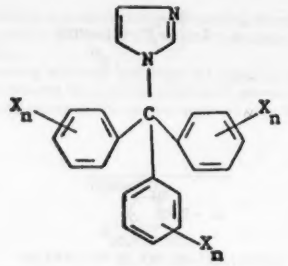
Continuation of Ser. No. 267,610, June 29, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 37,841, May 15, 1970, Pat. No. 3,691,192, and Ser. No. 37,850, May 15, 1970, Pat. No. 3,711,497, each is a division of Ser. No. 789,601, Jan. 7, 1969, abandoned, and Ser. No. 762,161, Sept. 24, 1968, abandoned. This application Apr. 18, 1974, Ser. No. 461,886

Claims priority, application Germany, Sept. 26, 1967, 53587; Jan. 29, 1968, 1670976. The portion of the term of this patent subsequent to Jan. 6, 1990, has been disclaimed.

Int. Cl.² C07D *233/62*

U.S. Cl. 260—309 69 Claims

1. A process for the production of an N-tritylimidazole of the formula:

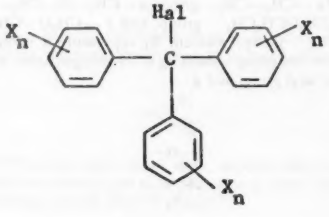


wherein

X is halogen, and 2 *n*'s are 0 and 1 *n* is 1,

which consists essentially of reacting imidazole of the formula:

with a tritylhalide of the formula



wherein X and *n* are as above defined, and Hal is halo, in a polar inert organic solvent having a dielectric constant greater than 15 at a temperature substantially between about 0°C to 100°C in the presence of an organic acid binding agent.

3,929,821
5 (6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES

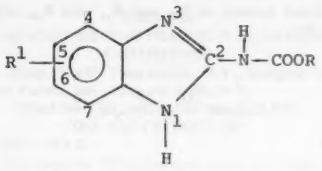
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 319,299, Dec. 29, 1972, abandoned. This application Nov. 21, 1973, Ser. No. 417,963

Int. Cl.² C07D *235/02*

U.S. Cl. 260—309.2 36 Claims

1. A compound selected from the group of compounds represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R^1 is —SR^5; and R^5 is lower alkenyl or lower alkynyl having 3 to 7 carbon atoms, benzyl or phenethyl, said lower alkenyl or lower alkynyl group being optionally substituted with one or more alkoxy having 1 to 6 carbon atoms, phenyl, naphthyl, thiocyanato, benzoyl, naphthoyl, hydroxy, cycloalkyl having 3 to 7 carbon atoms, halo, cyano, or nitro radicals, said benzyl or phenethyl group being optionally substituted with one or more lower alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, halo, nitro, cyano, thiocyanato, isothiocyanato, trifluoromethyl, alkylthio having 1 to 6 carbon atoms, alkylsulfinyl having 1 to 6 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms, alkanoyl or alkanoylamino where the alkanoyl portion has 1 to 6 carbon atoms, $—SO_2NR^3R^4$ or $—N(R^3)SO_2R^4$ radicals; where R^3 and R^4 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms; the R^1 substituent being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

3,929,822

1,5(6)-DISUBSTITUTED BENZIZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

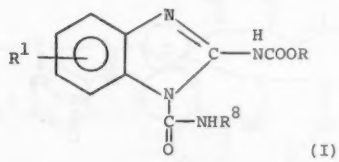
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 417,963, Nov. 21, 1973, which is a continuation-in-part of Ser. No. 319,299, Dec. 29, 1972, abandoned. This application May 28, 1974, Ser. No. 473,865

Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **32 Claims**

1. A compound selected from the group of compounds represented by the formula:



(I)

where R is lower alkyl having 1 to 4 carbon atoms; R^1 is —SOR^2, —SR^5, —OR^5 or $M'(CH_2)_nMR^7$; R^2 is lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, lower alkenyl or lower alkynyl having 3 to 6 carbon atoms, phenyl, benzyl or phenethyl; R^5 is lower alkenyl or lower alkynyl having 3 to 6 carbon atoms, benzyl or phenethyl; R^7 is lower alkyl having 1 to 4 carbon atoms or phenyl; M and M' are independently O, S, S or S;

n is 1–4; and R^8 is phenyl, benzyl, phenethyl, or lower alkyl having 1 to 12 carbon atoms and optionally substituted with a —COOR group where R is lower alkyl having 1 to 4 carbon atoms; the R^1 substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

3,929,823

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

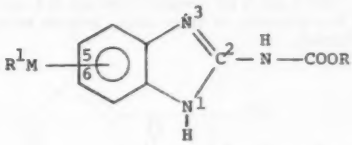
Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 417,969, Nov. 21, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 518,130

Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **15 Claims**

1. A compound represented by the formula:



(I)

where R is a lower alkyl group having 1 to 4 carbon atoms; M is O or S; and R^1 is an alkyl group having 1 to 6 carbon atoms and is substituted with one or more halo or cyano radicals; the R^1M-substitution being at the 5(6)-position; or a pharmaceutically acceptable salt thereof.

3,929,824

5(6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATES HAVING ANTHELMINTIC ACTIVITY

Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 417,963, Nov. 21, 1973, which is a continuation-in-part of Ser. No. 319,299, Dec. 29, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,861

Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **9 Claims**

2. The compound of claim **1** wherein said compound is 5(6)-[2-(benzyloxy)ethoxy]-2-carbomethoxyaminobenzimidazole.

3. The compound of claim **1** wherein said compound is 5(6)-(3-chloroprop-1-ylsulfinyl)-2-carbomethoxyaminobenzimidazole.

4. The compound of claim **1** wherein said compound is 5(6)-[2-(p-chlorophenoxy)ethoxy]-2-carbomethoxyaminobenzimidazole.

7. The compound of claim **1** wherein said compound is 5(6)-(but-3-en-1-ylthio)-2-carbomethoxyaminobenzimidazole.

3,929,825

PYRAZOLOXANTHENE COMPOUNDS AND PROCESS FOR PRODUCING SAME

Sidney M. Spatz, Circleville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 18, 1974, Ser. No. 461,860

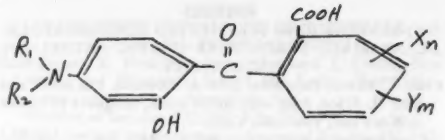
Int. Cl.² C07D *231/54*, *231/56*

U.S. Cl. 260—310 C **16 Claims**

1. A process for producing a color precursor having a pyrazoloxanthene structure by

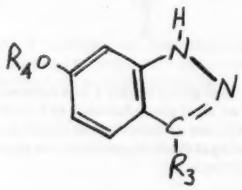
1. reacting about eqimolar quantities of at least one member of (A) with (B) wherein

A. is a 2-(4′-N,N-substituted amino-2′ hydroxybenzoyl)-benzoic acid having the formula



wherein R_1 and R_2 are hydrogen or lower alkyl groups of from 1 to 4 carbon atoms, X and Y are hydrogen, haolgen or lower alkyl of from 1 to 3 carbon atoms and n and m are integers whose sum is 4, and

B. is a 6-hydroxy or lower alkoxy indazole having the formula



wherein R_3 is hydrogen or methyl and R_4 is hydrogen, methyl or ethyl,

2. for a time period ranging from 1 to 24 hours,
3. at a temperature ranging from 110° to 35°C,
4. in sulfuric acid having a concentration above 70%, and thereafter recovering the reaction product.

3,929,826

INDAZOLE DERIVATIVES AS OPTICAL BRIGHTENERS

Mauro Stagi, Allschwil, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

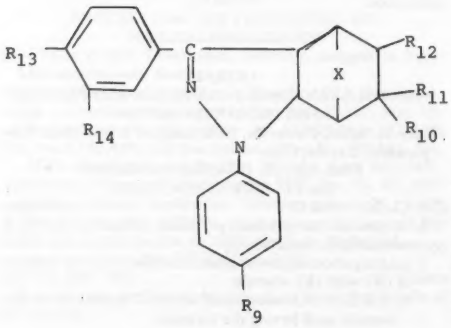
Division of Ser. No. 241,385, April 5, 1972, Pat. No. 3,828,069. This application May 20, 1974, Ser. No. 471,514

Claims priority, application Switzerland, Apr. 19, 1971, 5632/71

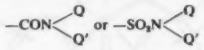
Int. Cl.² C07D *231/54*

U.S. Cl. 260—310 D **4 Claims**

1. A 1,3-Diaryl-3a,4,5,6,7,7a-hexahydroindazole corresponding to the formula



or positional isomers of R_{10} and R_{11} with R_{12}, wherein R_9 denotes the



radicals, wherein Q and Q′ independently of one another represent hydrogen, alkyl with 1 to 4 carbon atoms or alkyl with 1 to 4 carbon atoms substituted by hydroxyl or alkoxy, or represents the $—SO_2Q''$ radical, wherein Q'' represents alkyl with 1 to 4 carbon atoms or alkyl with 1 to 4 carbon atoms substituted by hydroxyl, amino, sulphonic acid or carboxylic acid or represents alkenyl with 2 to 4 carbon atoms, R_{10} denotes hydrogen or nitrile, R_{11} and R_{12} independently one of another denote hydrogen, nitrile, alkyl possessing 1 to 4 carbon atoms, or a —COOY or

radical, wherein Y and Y′ independently of one another represent hydrogen, alkyl of 1 to 4 carbon atoms, hydroxy-substituted alkyl of 1 to 4 carbon atoms, or R_{11} and R_{12} together denote a fused benzene ring, R_{13} and R_{14} independently of one another denote hydrogen, chlorine or alkyl of 1 to 3 carbon atoms and X denotes $—CH_2—$.

3,929,827

1N,1N′-PHENYLENBIS(5-METHYL-4-PYRAZOLIN-3-ONES) AND PROCESS FOR PREPARING SAME

Carlo Venturello, Turin, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy

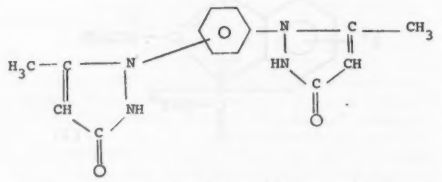
Filed Sept. 25, 1973, Ser. No. 400,516

Claims priority, application Italy, Sept. 26, 1972, 29674/72

Int. Cl.² C07D *231/08*

U.S. Cl. 260—310 A **3 Claims**

1. A process for preparing 1N, 1N′-para- or meta-phenylenbis (5-methyl-4-pyrazolin-3-ones) having the formula



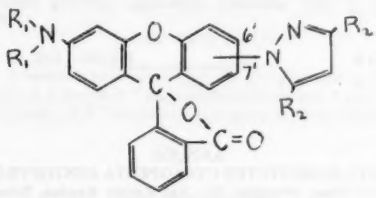
which comprises reacting solid para- or, respectively, meta-phenylendiamine tetrazonium sulphate with diacetyl dimer in aldolic form, in a molar ratio of from 6:1 to 7:1, for about six hours, under atmospheric pressure and at a temperature of 30°C to 50°C, washing the reaction product comprising the salt of the 1N, 1N′-para- or meta-phenylenbis (5-methyl-4-pyrazolin-3-one) thus obtained with ether to remove unreacted diacetyl dimer, and dispersing the salt in water to liberate H_2SO_4 and recover the 1N, 1N′-para- or meta-phenylenbis (5-methyl-4-pyrazolin-3-one).

3,929,828
3'-AMINO-6' OR 7'-(PYRAZOL-1-YL)FLUORAN COMPOUNDS

Derek J. Alsop, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,991
Int. Cl.² C07D 231/00
U.S. Cl. 260—310 R 2 Claims

1. A chromogenic 3'-amino-(pyrazol-1-yl) fluoran compound having the following structural formula:



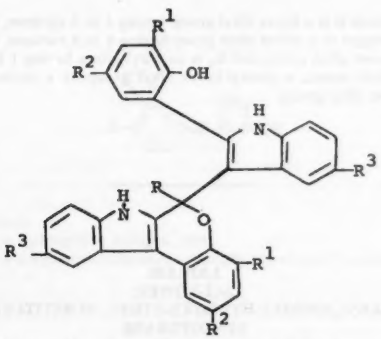
wherein each R_1 represents either a hydrogen atom or a lower alkyl group of from one to five carbon atoms; wherein each R_2 represents either a hydrogen atom, a lower alkyl group of from one to five carbon atoms or a phenyl group; and wherein the pyrazol group is attached to the fluoran moiety at either the 6' position or the 7' position of the latter.

3,929,829
PH SENSITIVE DYES CONTAINING A PHENOLATE GROUP

Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 204,326, Dec. 2, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,693
Int. Cl.² C07D 209/14
U.S. Cl. 260—326.15 5 Claims

1. A pH sensitive indicator dye of the formula:



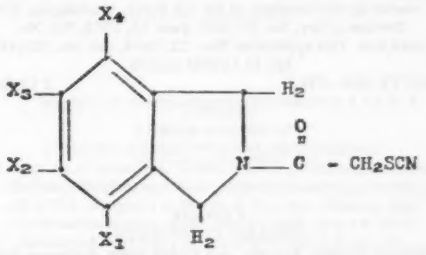
wherein R is hydrogen or a hydrocarbon group containing up to 20 carbon atoms selected from alkyl, aryl selected from phenyl and naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; R^1 and R^2 the same are hydrogen, chloro, or nitro; and R^3 is hydrogen; carboxy; —$NHSO_2R'$ wherein R' contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; —SO_2NHR'' wherein R'' contains up to 20 carbon atoms and is selected from alkyl, phenyl, naphthyl, phenyl-substituted alkyl and alkyl-substituted phenyl; or alkoxy, said alkoxy containing 1 to 18 carbon atoms.

3,929,830
N-(α-THIOCYANOACETYL)INDOLINES

Sidney B. Richter, Chicago, and Alfred A. Levin, Skokie, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 284,295, Aug. 28, 1972, Pat. No. 3,869,471, which is a division of Ser. No. 165,348, July 22, 1971, Pat. No. 3,723,439, which is a continuation-in-part of Ser. No. 732,822, May 29, 1968, abandoned. This application Apr. 5, 1974, Ser. No. 461,076
Int. Cl.² C07D 209/44
U.S. Cl. 260—326.1 2 Claims

1. A compound of the formula



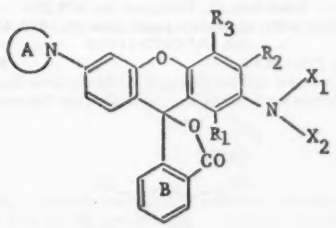
wherein X_1, X_2, X_3 and X_4 are independently selected from the group consisting of hydrogen, lower alkyl, chlorine, bromine, trifluoromethyl, lower alkoxy and nitro provided that only one of X_1, X_2, X_3 and X_4 is nitro or tertiary lower alkyl and at least two of X_1, X_2, X_3 and X_4 are hydrogen.

3,929,831
HETEROCYCLIC SUBSTITUTED FLUORANS

Robert Garner, Ramsbottom Bury, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 18, 1974, Ser. No. 507,158
Claims priority, application United Kingdom, Sept. 26, 1973, 45048/73; Oct. 23, 1973, 49331/73
Int. Cl.² C07D 207/14, 207/24, 207/26
U.S. Cl. 260—326.34 8 Claims

1. A fluoran compound of the formula



wherein

R_1, R_2 and R_3 independently of the other, represent hydrogen, alkyl with one to four carbon atoms, nitro or halogen, or

R_2 and R_3 together complete a condensed carbocyclic ring,

X_1 and X_2 independently of the other, represent hydrogen, alkyl with one to 12 carbon atoms, alkenyl with at most 12 carbon atoms, alkoxyalkyl with two to eight carbon atoms, alkoxycarbonylalkyl with three to nine carbon atoms, cycloalkyl with five or six carbon atoms,

acyl having one to 12 carbon atoms, or an unsubstituted or substituted benzyl, phenyl or naphthyl radical, and the nitrogen ring A represents the pyrrolidinyl radical and the benzene ring B is unsubstituted or substituted by nitro or one to four halogen atoms.

3,929,832
2,3,7,8-TETRAAMINODIBENZOTHIOPHENE 5,5-DIOXIDE AND PROCESS THEREFOR

Albert J. Sicree, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 371,089, June 18, 1973, Pat. No. 3,865,841. This application Nov. 22, 1974, Ser. No. 526,191
Int. Cl.² C07D 333/76
U.S. Cl. 260—329.3 **2 Claims**

1. 2,3,7,8-Tetraaminodibenzothiophene-5,5-dioxide.

3,929,833
ORGANIC COMPOUNDS

Manfred Krieger, Pratteln, and Rudolf Süess, Bettingen, both of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

Continuation of Ser. No. 193,165, Oct. 27, 1971, abandoned. This application May 9, 1974, Ser. No. 468,378
Claims priority, application Switzerland, Oct. 30, 1970, 16064/70; July 6, 1971, 9888/71
Int. Cl.² C07D 333/24
U.S. Cl. 260—332.2 C **4 Claims**

1. The compound, which is 3-hydroxy-2-(4-methoxyphenyl)-4-thiophenecarboxylic acid ethyl ester.

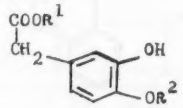
4. The compound, which is 2-(3-chlorophenyl)-3-hydroxy-4-thiophenecarboxylic acid ethyl ester.

3,929,834
3-ISOCHROMANONE DERIVATIVES

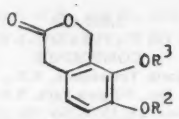
Wataru Nagata, Nishinomiya, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed June 13, 1974, Ser. No. 479,256
Claims priority, application Japan, June 26, 1973, 48-72057
Int. Cl.² C07D 311/20
U.S. Cl. 260—343.2 R **8 Claims**

1. A process for producing 3-isochromanone derivatives which comprises reacting a compound of the formula:



wherein R' represents hydrogen or lower alkyl and R^2 is lower alkyl with formaldehyde or with a compound, which under the conditions of the reaction, yields formaldehyde, said reaction being carried out in the presence of a boron compound selected from the group consisting of boric acids, boric acid esters, tetraalkoxyboranes, boronic acids, boroxines, acyloxyboranes, alkoxyboranes and alkoxyhaloboranes and then alkylating or aralkylating the product to yield a compound of the formula:



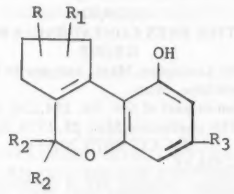
wherein R^2 has the same meaning as mentioned above, and R^3 represents lower alkyl or aralkyl.

3,929,835
ALKYL SUBSTITUTED CYCLOPENTA BENZOPYRANS

Martin Winn, Deerfield, Ill.; Raj Kumar Razdan, Belmont; Haldean Cloyce Dalzell, Weston, both of Mass., and Joyce Ruth Krei, Glenview, Ill., assignors to Sharps Associates, Cambridge, Mass.

Filed Aug. 29, 1973, Ser. No. 392,635
Int. Cl.² C07D 311/94
U.S. Cl. 260—345.3 **8 Claims**

1. A compound of the formula



wherein R is a lower alkyl group having 1 to 5 carbons, R_1 is hydrogen or a lower alkyl group having 1 to 5 carbons, R_2 is a lower alkyl group and R_3 is an alkyl group having 1 to 20 carbon atoms, a phenyl-lower alkyl group or a cycloalkyl lower alkyl group.

3,929,836
2-(2-LOWER ALKYLAMINO-1-HYDROXY-ETHYL)-SUBSTITUTED BENZOFURANS

Graham Alwyn Fothergill, Knebworth; John Mervyn Osbond, Hatfield, and James Charles Wickens, Saint Albans, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 547,176, May 3, 1966, abandoned. This application Feb. 11, 1970, Ser. No. 10,645
Claims priority, application United Kingdom, May 11, 1965, 19823/65; Dec. 15, 1965, 53208/65; Mar. 18, 1966, 19823/66; Dec. 15, 1965, 53209/65; Dec. 15, 1965, 53210/65; Feb. 4, 1966, 4931/66
Int. Cl.² C07D 307/80
U.S. Cl. 260—346.2 R **6 Claims**

1. 2-(2-isopropylamino-1-hydroxy-ethyl)-6,7-dimethyl-benzofuran.

3,929,837
2,3-DIHYDRO-2,2-DIMETHYL-7-ISOPROPYL BENZOFURAN AND 2-(2,3-DIHYDRO-2,2-DIMETHYL-7-BENZOFURANYL)ISOPROPYL HYDROPEROXIDE

Alexander Serban, Doncaster, and Phillip Knox Engel, Tullamarine, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

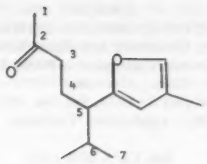
Division of Ser. No. 411,404, Oct. 31, 1973, Pat. No. 3,876,667, which is a division of Ser. No. 297,724, Oct. 16, 1972, Pat. No. 3,816,473. This application Jan. 16, 1975, Ser. No. 541,662

Claims priority, application Australia, Nov. 8, 1971, 6929/71

Int. Cl.² C07D *307/79*

U.S. Cl. 260—346.2 R **3 Claims**

1. A benzofuran selected from the group consisting of 2,3-dihydro-2,2-dimethyl-7-isopropylbenzofuran and 2-(2,3-dihydro-2,2-dimethyl-7-benzofuranyl)isopropylhydroperoxide.



I

3,929,838
N-METHYL-N-(3-TRIFLUOROMETHYLPHENYLMERCAPTO)-CARBAMIC ACID DIHYDROBENZOFURANYL ESTERS

Peter Siegle, Cologne; Engelbert Kühle, Berg. Gladbach; Wolfgang Behrenz, and Ingeborg Hammann, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

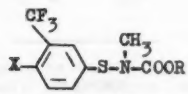
Filed May 15, 1973, Ser. No. 360,485

Claims priority, application Germany, May 27, 1972, 2225872; Sept. 15, 1972, 2245344

Int. Cl.² C07D *307/79*

U.S. Cl. 260—346.2 R **3 Claims**

1. An N-sulfenylated N-methylcarbamic acid aryl ester of the formula



(I)

in which

X is hydrogen or halogen, and

R is dihydrobenzofuranyl optionally substituted by methyl.

3,929,839
FLAVOURING AND PERFUMING INGREDIENT

Edouard P. Demole, Coppet, Vaud, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 370,050, June 14, 1973, Pat. No. 3,857,403. This application July 31, 1974, Ser. No. 493,486

Int. Cl.² C07D *307/46*

U.S. Cl. 260—347.8 **2 Claims**

1. A pure compound of formula

3,929,840
LABILE ESTERS OF (−)(CIS-1,2-EPOXYPROPYL)PHOSPHONIC

Burton G. Christensen, Scotch Plains; William J. Leanza, Berkeley Heights, and Georg Albers-Schonberg, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 271,855, July 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 849,206, Aug. 11, 1969, abandoned, which is a continuation-n-part of Ser. No. 755,805, Aug. 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 729,444, May 15, 1968, abandoned. This application Apr. 12, 1974, Ser. No. 460,330

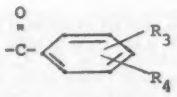
Int. Cl.² C07F *9/40*

U.S. Cl. 260—348 A **7 Claims**

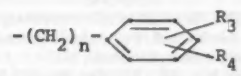
1. A labile ester of (−) (cis-1,2-epoxypropyl)phosphonic acid of the formula

wherein R is hydrogen or R_1, and R_1 is a group of the formula $-CH_2OR_2$

wherein R_2 represents lower alkanoyl, benzoyl, a substituted benzoyl group of the formula



where R_3 represents loweralkyl, loweralkoxy, haloloweralkyl, halo or nitro and R_4 represents R_3 or hydrogen, or a group of the formula



where *n* is 0 or 1 and R_3 and R_4 are the same as defined above, and the sodium salt thereof when R is hydrogen.

3,929,841

ISOLATION OF 1,5-DINITROANTHRAQUINONE

Otto Ackermann, Otterstadt, and Heinz Eilingsfeld, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 2, 1974, Ser. No. 485,213

Claims priority, application Germany, July 7, 1973, 2334713

Int. Cl.² C09B 1/00

U.S. Cl. 260—369 6 Claims

1. A process for the isolation of 1,5-dinitroanthraquinone by extraction from a dinitroanthraquinone mixture which has been obtained by dinitration of anthraquinone wherein such an amount of N-methylpyrrolidone is allowed to act on the dinitroanthraquinone mixture that from 10 to 45% by weight of the mixture remains undissolved.

3,929,842

ANTHRAQUINONE DISPERSE DYES

Eiji Yamada, Ibaragi, and Masao Nishikuri, Hirakata, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

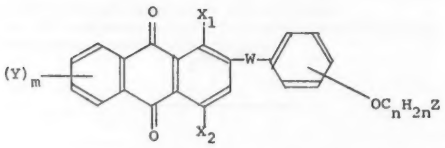
Filed Aug. 27, 1973, Ser. No. 391,872

Claims priority, application Japan, Sept. 6, 1972, 47-89818

Int. Cl.² C09B 1/54, 1/56

U.S. Cl. 260—376 4 Claims

1. A compound of the formula,



wherein X_1 and X_2 each are an amino or hydroxyl group, Y is a halogen atom, W is an oxygen or sulfur atom, Z is —COOR in which R is a hydrogen atom, a C_1–C_8 alkyl group unsubstituted or substituted with a lower alkoxy or phenyl group or a halogen atom, or a phenyl group unsubstituted or substituted by a lower alkyl or alkoxy group or a halogen atom, *n* is an integer of from 1 to 7, and *m* is 0, 1 or 2.

3,929,843

DIHYDROXYTHIOPHENOXYANTHRAQUINONES

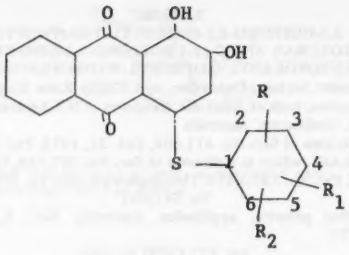
Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Nov. 26, 1974, Ser. No. 527,370

Int. Cl.² C07C 49/74; C09B 1/02

U.S. Cl. 260—383 5 Claims

1. A dye of the formula:



in which R, R_1 and R_2 are members independently selected from the group consisting of hydrogen, lower alkyl, hydroxy lower alkyl, chlorine and bromine.

3,929,844

3-CYCLOPENTYL ETHERS OF 7α-METHYL ESTRONE

Georg Anner, and Jaroslav Kalvoda, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

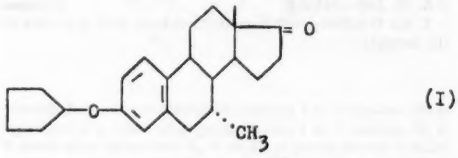
Continuation of Ser. No. 136,161, April 21, 1971, abandoned. This application Aug. 31, 1973, Ser. No. 393,518

Claims priority, application Switzerland, Apr. 24, 1970, 6217/70

Int. Cl.² C07J 1/00

U.S. Cl. 260—397.4 1 Claim

1. The 3-cyclopentyl ether of 7α-methyloestrone of the formula



(I)

3,929,845

PREPARATION OF ALKYLAMIDES

Roger G. Duranleau, Ardonia, and John M. Larkin, Wappinger Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 532,290

Int. Cl.² C07C 103/02

U.S. Cl. 260—404 14 Claims

1. A method of preparing an alkylamide which comprises contacting a nitroketone with hydrochloric acid as catalyst in the presence of a carboxylic acid solvent.

3,929,846

ETHER TRIESTER DERIVATIVES OF P-DIOXANONE

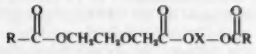
Thomas C. Snapp, Jr., and Alden E. Blood, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 25, 1974, Ser. No. 508,313

Int. Cl.² C09F 5/08

U.S. Cl. 260—410.6 19 Claims

1. A compound having the formula



wherein R is alkyl of from 1 to 7 carbon atoms and X is an alkyl of 2 to 8 carbon atoms or $-CH_2CH_2)_nO_{n-1}$ where n is an integer of from 2 to 4.

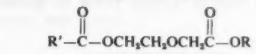
3,929,847

ETHER DIESTER DERIVATIVES OF P-DIOXANONE

Thomas C. Snapp, Jr., and Alden E. Blood, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 25, 1974, Ser. No. 508,314
Int. Cl.² C09F *5/08*
U.S. Cl. 260—410.6 **21 Claims**

1. A compound having the formula



wherein R is alkyl of from 1 to 8 carbon atoms and R′ is alkyl of from 1 to 7 carbon atoms.

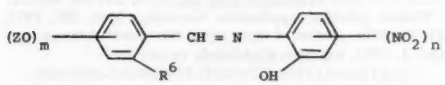
3,929,848

CHROME-COMPLEXING AZOMETHINE DYES

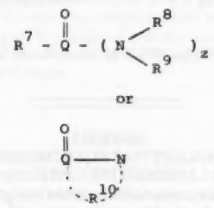
Henry Bader, Newton Center, Mass., and Edwin G. Jahngen, Jr., Burlington, Vt., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 47,174, June 17, 1970, abandoned. This application July 19, 1971, Ser. No. 164,103
Int. Cl.² C07F *11/00*
U.S. Cl. 260—438.5 R **31 Claims**

1. A process for producing a chrome-complexed azomethine dye which comprises the step of chrome-complexing an azomethine dye of the formula:



wherein Z is hydrogen or an alkyl radical containing from 1–8 carbon atoms, m and n' are the integers 1 or 2 and R^6 is OH or alkoxy containing from 1–8 carbon atoms; with a chroming reagent prepared by dehydrating a chrome-containing compound in the presence of a dipolar solvent of the formulae:



wherein R^7 is hydrogen or alkyl having from 1–8 carbon atoms; Q is carbon, phosphorus or sulfur; R^8 and R^9 are hydrogen, alkyl or aryl and can be the same or different; z is the integer 1, 2 or 3; and R^{10} represents the carbon atoms necessary to complete a 5 or 6 membered ring.

9. A process of claim **1** including the step of reacting the produced chrome-complexed azomethine dye with a ligand containing a p-dihydroxyphenyl substituent or protected derivative thereof to produce a 1:1 chrome-complesed azomethine dye chrome-complexed

---

3,929,849

TETRAALKYL PHOSPHONIUM ALUMINOSILICATES

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 1, 1973, Ser. No. 402,465
Int. Cl.² C07F *5/06*
U.S. Cl. 260—448 C **16 Claims**

1. Tetra-alkyl phosphonium clays of layer and chain type structure.

3,929,850

PROCESS FOR THE PRODUCTION OF POLYMERIC HYDROCARBONS HAVING REACTIVE SILYL END GROUPS

Roland Streck, and Heinrich Weber, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Division of Ser. No. 306,989, Nov. 16, 1972, Pat. No. 3,857,825. This application Sept. 30, 1974, Ser. No. 510,761
Claims priority, application Germany, Nov. 19, 1971, 2157405
Int. Cl.² C07F *7/08, 7/18*
U.S. Cl. 260—448.2 E **19 Claims**

1. A process for preparing liquid polymeric hydrocarbons having reactive silyl end groups by catalyzed ring opening polymerization of a cyclic olefin, which comprises reacting:

a. a cyclomonoalkene or non-conjugated cyclopolyalkene monomer capable of catalytic ring opening polymerization having at least one metathetical unsubstituted, ethylenically unsaturated double bond in a hydrocarbon ring which contains 4, 5, 7 or more ring carbon atoms;

b. about 0.001-1.0 mole per mole of said monomer of a tetrasubstituted organic silicon compound consisting essentially of

i. at least one metathetical organic group having at least one unsubstituted, ethylenically unsaturated, non-conjugated, acyclic double bond, which group is bonded to silicon via a carbon-silicon bond;

ii. at least one hydrolyzable group bonded to a silicon atom via a carbon-silicon bond, selected from the group consisting of halogen, lower alkoxy, lower alkanoyloxy, carbocyclic aroyloxy of 6–12 carbon atoms and lower ketoxime; and

iii. any remaining silicon valences bearing a carbon-silicon bond; in the presence of

d. a catalytic amount of a cycloolefin metathesis catalyst comprising:

i. a halogenated compound of a metal in Subgroups 5–7 of the Mendeleyeev Periodic Table; and

ii. a metal, metal alkyl or metal hydride of a metal in Main Groups 1–3 of the Mendeleyeev Periodic Table;

in a reaction media substantially free of conjugated diolefins, alkines, water and H-acidic compounds, at a temperature of about −50° C. to +80° C. to form a liquid polymeric hydrocarbon chain having reactive silyl end groups.

3,929,851

PROCESS FOR PRODUCING HALOGENATED COMPOUNDS

John Heathcote Atherton; John Beckett Plumb, and Ronald Sangster Stuart, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 23, 1974, Ser. No. 435,957

Claims priority, application United Kingdom, Jan. 31, 1973, 4766/73

Int. Cl.² C07F 7/08, 7/18

U.S. Cl. 260—448.2 E 15 Claims

1. A process for the production of organosilicon compounds having at least one group XR—, where X is a halogen other than fluorine and R is a divalent hydrocarbon group, attached to silicon which comprises reacting an organosilicon compound having at least one group R^1OR—, where R^1 is a hydrocarbyl group, with a reagent consisting essentially of fluorine-free thionyl halides to replace the R^1O group by halogen.

3,929,852

PROCESS FOR PREPARING α,β-UNSATURATED THIOLESTERS

Nicholas Kydonieus, Wayne, and Stanley Robert Sandler, Springfield, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 1, 1974, Ser. No. 465,788

Int. Cl.² C07C 153/11

U.S. Cl. 260—455 R 11 Claims

1. In the process of preparing an α,β-unsaturated thiolester via the reaction of an α,β-unsaturated carboxylic acid chloride, fluoride, bromide or anhydride with a mercaptan, the improvement which comprises conducting said reaction with the reactants in contact with a catalytically effective amount of compound selected from the group consisting of the chlorides and bromides of iron, tin, aluminum, boron, titanium, vanadium, zirconium, manganese, chromium, antimony, indium, tantalum, tellurium, bismuth, mercury, phosphorus, and silicon; the fluorides of boron and antimony; the sulfates of iron; and the oxides of iron and tin.

3,929,853

PREPARATION OF CYCLOPENTANE DERIVATIVES

Albert Eduard Fischli, Basel, Switzerland; Michael Josef Klaus, Weil am Rhine, Germany; Hans Johann Mayer, Fullinsdorf, and Alexander Eduard Wick, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

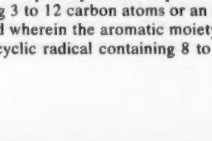
Filed Aug. 20, 1973, Ser. No. 389,756

Claims priority, application Switzerland, Aug. 28, 1972, 12684/72; July 12, 1973, 10165/73

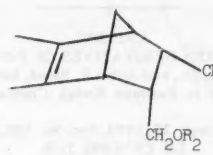
Int. Cl.² C07C 47/40

U.S. Cl. 260—456 R 2 Claims

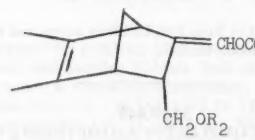
1. A process for preparing a compound of the formula:



wherein R_3 is a radical derived from an optically active or inactive monocyclic, bicyclic or tricyclic aromatic dicarboxylic acid containing 8 to 20 carbon atoms or an aliphatic dicarboxylic acid containing 3 to 12 carbon atoms, by removal of the hydrogen from one of the carboxyl groups, a radical derived from an optically active aliphatic mono-carboxylic acid containing 3 to 12 carbon atoms or an araliphatic monocarboxylic acid wherein the aromatic moiety is a monocyclic, bicyclic or tricyclic radical containing 8 to 20 carbon atoms and the aliphatic moiety contains 3 to 12 carbon atoms, by removal of the hydrogen of the carboxyl group, a radical derived from an optically active sulfonic acid by removal of the hydrogen of the sulfanoyl group and the radical derived from an optically active carbamic acid by removal of the hydrogen from the carbamoyl group; comprising treating a compound of the formula:



wherein R_3 is as above; with a mixture of sodium acetate and acetic anhydride to form an enol acetate of the formula:



wherein R_2 is as above; and thereafter saponifying said enol acetate with pyridine in methanol.

3,929,854

BUNTE SALTS CONTAINING FLUORO-ALKYL GROUPS

Karl Waldmann, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 238,524, March 27, 1972, Pat. No. 3,839,417. This application June 28, 1974, Ser. No. 484,161

Claims priority, application Germany, Mar. 29, 1971, 2115140The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.

Int. Cl.² C07C 141/02

U.S. Cl. 260—458 6 Claims

1. A compound of the formula

$$X-C_aF_{2a}-V-S_2O_3-M$$

in which X is hydrogen or fluorine, a is a number from 4 to 14, V is a bivalent radical which contains at least one but not more than a methylene groups and which does not contain in the terminal position related to the thiosulfato group an ethylene group activated by a sulfonyl or carbonyl group, V having the formula

$$-(CHR')_b-(O)_c-(Z)_d-NR-(CH_2)_g-$$

3,929,855

N-1,3-DIMETHYLBUTYL-N'-1,4-DIMETHYLPENTYL-P-PHENYLENEDIAMINE ANTIOZONANTS

Charles Gene Summers, Medina, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 10, 1974, Ser. No. 513,712

Int. Cl.² C08G 6/00

U.S. Cl. 260—45.9 QB 3 Claims

1. Vulcanizable diene rubber having incorporated therein a stabilizing amount of N-1,3-dimethylbutyl-N'-1,4-dimethylpentyl-p-phenylenediamine.

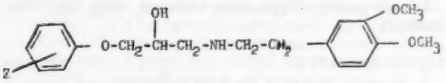
3,929,856

1-(3,4-DIMETHOXYPHENETHYLAMINO)-3-(PHENOXY)-2-PROPANOLS

Ann Holmes, and Robert F. Meyer, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Division of Ser. No. 207,954, Dec. 14, 1971, Pat. No. 3,857,891. This application Sept. 3, 1974, Ser. No. 502,591
Int. Cl.² C07C 93/06, 121/80
U.S. Cl. 260—465 E 4 Claims

1. A member of the class consisting of compounds of the formula



and acid-addition salts thereof; where Z is a member of the class consisting of lower alkoxy, chloro, cyano, hydroxymethyl, acetyl, and o-allyl.

3,929,857

1,1-DI(AMINOALKYLTHIO)-2,2-DICYANOETHYLENES

John Joseph D'Amico, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 224,968, Feb. 9, 1972, Pat. No. 3,776,891. This application Aug. 8, 1973, Ser. No. 386,756
Int. Cl.² C07C 121/30
U.S. Cl. 260—465.5 R 6 Claims

1. A compound of the formula

$$(CN)_2C{=}C(S-A-NRR_1)_2$$

in which A is dimethylene, 1-methyl-dimethylene, trimethylene, 1-methyl-trimethylene or tetramethylene, and R and R_1 independently are lower alkyl, aralkyl of 7–10 carbon atoms, or cycloalkyl of 5–8 ring carbon atoms or R and R_1 together with the nitrogen is a heterocyclic radical of 4–8 carbon atoms.

3,929,858

METHOD FOR PREPARING 2-BROMO-2-BROMOMETHYL-GLUTARONITRILE

Roger D. Swigert, Rahway, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 3, 1974, Ser. No. 529,014
Int. Cl.² C07C 120/00, 121/20
U.S. Cl. 260—465.7 4 Claims

1. A method for preparing 2-bromo-2-bromomethyl-glutaronitrile comprising reacting substantially equimolar quantities of bromine and 2-methyleneglutaronitrile in a solvent selected from the group consisting of water or carbon tetrachloride wherein there is 0.75 to 1.5 parts by weight of water or 0.5 to 1.5 parts by weight carbon tetrachloride employed for each part by weight of 2-methyleneglutaronitrile at a temperature of from about 70°C. to about 110°C. for from about ¼ hour to 4 hours.

3,929,859

MANUFACTURE OF DINITRILES FROM THIODINITRILES

James L. Callahan, Wooster, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 18, 1974, Ser. No. 524,729
Int. Cl.² C07C 120/00, 121/20, 121/26, 121/64
U.S. Cl. 260—465.8 R 15 Claims

1. A process for producing a dinitrile of the formula

$$NC-R-R'-CN$$

from a thiodinitrile of the formula

$$NC-R''-S-R'''-CN$$

wherein:

R, R', R'' and R''' are aliphatic or aromatic hydrocarbon radicals; and

R and R'' have the same number of carbon atoms and R' and R''' have the same number of carbon atoms

comprising heating the thiodinitrile at a temperature of 200° to 700°C.

3,929,860

SULFOLANE OR AQUEOUS SULFOLANE AS DILUENT FOR PREPARATION OF UNSATURATED NITRILES FROM LOWER UNSATURATED NITRILES AND OLEFINS

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1974, Ser. No. 518,748
Int. Cl.² C07C 120/00, 121/30, 121/48, 121/70
U.S. Cl. 260—465.9 28 Claims

1. In a method wherein at least one olefinic hydrocarbon compound is reacted with at least one olefinically unsaturated nitrile reactant in the presence of a diluent under suitable reaction conditions to produce, as the principal product, at least one olefinically unsaturated nitrile product having a greater number of carbon atoms than said unsaturated nitrile reactant;

said at least one unsaturated nitrile reactant having the formula RCH=CR—CN, wherein each R is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

said at least one olefinic hydrocarbon compound having the formula $R'_2C{=}CR'{-}CHR'_2$, wherein each R' is independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, and aryl hydrocarbyl radicals and combinations thereof;

the improvement comprising conducting the reaction of said at least one olefinic hydrocarbon and said at least one olefinically unsaturated nitrile reactant in the presence of a diluent comprising at least one sulfolane compound and from zero to about 50 weight percent water, based on the total weight of said diluent; and wherein the amount of the total of said water, if present, and said at least one sulfolane compound is in the range of about 0.5 to about 40 parts by weight per part by weight of said at least one olefinically unsaturated nitrile reactant.

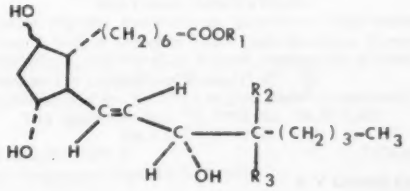
3,929,861

16- AND 16,16-METHYL AND ETHYL SUBSTITUTED PGF_1-TYPE COMPOUNDS

John E. Pike, Kalamazoo, and William P. Schneider, Kalamazoo Township, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 274,822, July 24, 1972, Pat. No. 3,813,433, which is a continuation-in-part of Ser. No. 123,388, March 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1967, abandoned. This application Feb. 11, 1974, Ser. No. 441,519
Int. Cl.² C07C 61/38, 69/74
U.S. Cl. 260—468 D 10 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein ~ indicates alpha or beta attachment of hydroxyl to the cyclopentane ring, R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation, and wherein R_2 and R_3 are methyl.

3,929,862

SUBSTITUTED TOLYLESTERS OF $PGF_2\alpha$

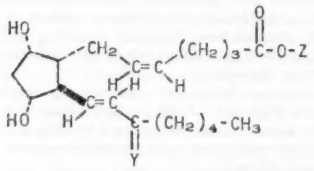
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,758, Jan. 8, 1974. This application Sept. 30, 1974, Ser. No. 510,233

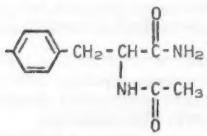
Int. Cl.² C07C *103/85*

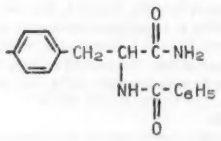
U.S. Cl. 260—468 D **8 Claims**

1. An optically active compound of the formula

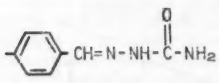


or a racemic compound of that formula and the mirror image thereof, wherein Z is

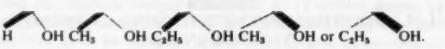




or



and wherein Y is



3,929,863

AROMATIC DIAMINO CARBONIC ACID ESTERS

Johannes Blahak, Colonge-Buchheim; Erwin Müller, and Helmut Kleimann, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

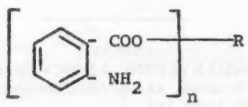
Filed Aug. 12, 1971, Ser. No. 171,381

Claims priority, application Germany, Aug. 17, 1970, 2040644

Int. Cl.² C07C *101/48*

U.S. Cl. 260—471 R **5 Claims**

1. Aromatic amines of the general formula



wherein *n* represents an integer of from 2 to 8, and R represents an n-valent saturated or unsaturated, straight chain or branched chain hydrocarbon radical which is interrupted by an O or S atom which is obtained by the removal of OH or SH groups from a polyol or polythiol having a molecular weight of from 76 to 599.

3,929,864

PROCESS FOR PREPARING 4-HYDROXY-3-NITROBENZOIC ACID ALKYL ESTERS

Theodor Papenfuss, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 27, 1973, Ser. No. 392,097

Int. Cl.² C07C *101/54*

U.S. Cl. 260—471 R **3 Claims**

1. A process for preparing a pure 4-hydroxy-3-nitrobenzoic acid alkyl ester by nitration of 4-hydroxybenzoic acid alkyl esters with nitric acid, wherein nitration is carried out at about 0° to 60°C with the aid of nitric acid having a strength of 30 to 62%.

3,929,865

N-1-NAPHTHYLCARBAMIC ACID-2,4,5-TRICHLOROPHENOL ESTER

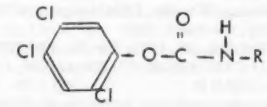
Mike Mehdi Fooladi, Apt. 4-B, Oakmont Manor Apts., Vicksburg, Miss. 39180

Filed Nov. 13, 1974, Ser. No. 523,496

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **1 Claim**

1. Compound having the formula



wherein R r is 1-naphthyl group.

3,929,866

DIESTERS OF TETRABROMOPHTHALIC ANHYDRIDE

James P. Baldino, Haddonfield, N.J., and Joseph Feltzin, Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Filed May 18, 1973, Ser. No. 361,476
Int. Cl.² C07C *69/80*
U.S. Cl. 260—475 P 2 Claims

1. A simple diester comprising the single step reaction product of tetrabromophthalic anhydride and a polyhydric alcohol selected from the group consisting of trimethylol propane, pentaerythritol, glycerol, the reaction product of propylene oxide and sorbitol, the reaction product of ethylene oxide and sorbitol, arabitol, xylitol, adonitol, mannitol, dulcitol, sorbitol, 1,2,4-benzenetriol, phloroglucinol, 1,2,3,5-benzenetetrol, 1,2,4,5-benzenetetrol, and benzenehexol, wherein the molar ratio of polyhydric alcohol to tetrabromophthalic anhydride is equal to 2 to 1.

3,929,867

MIXED ESTER PLASTIC ADDITIVE

Anthony W. McCollum, and David C. Hull, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1973, Ser. No. 385,759
Int. Cl.² C07C *69/82*
U.S. Cl. 260—475 P 3 Claims

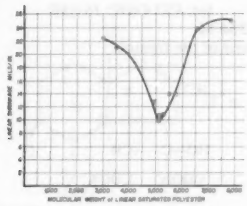
1. The mixed ester reaction product of 2,2,4-trimethylpentane-1,3-diol-monoisobutyrate, a monohydric alcohol of the form ROH where R is straight or branch-chained alkyl of 1 to 12 carbon atoms or benzyl, and dimethyl terephthalate wherein the molar ratio of the reactants is from about 0.1/1.9/1.0 to about 1.9/0.1/1.0 respectively and which mixture has an apparent molecular weight of from about 400 to about 1000.

3,929,868

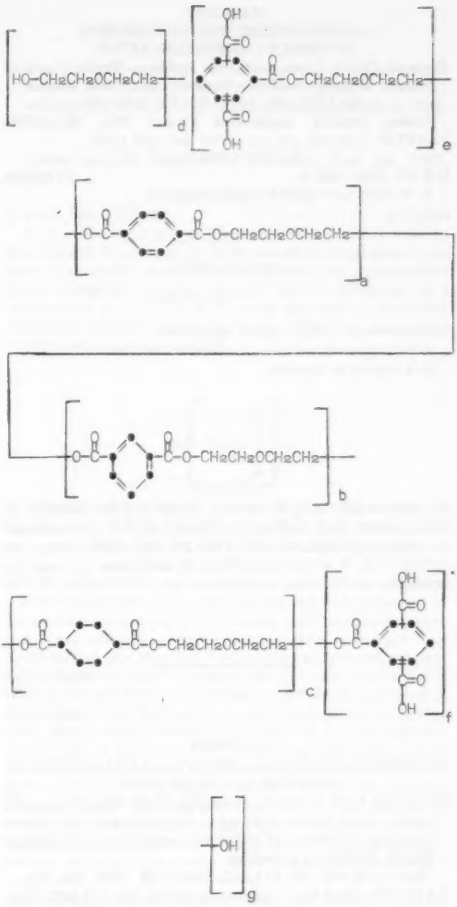
SATURATED POLYESTER USEFUL AS LOW SHRINK ADDITIVE FOR MOLDING COMPOSITIONS CONTAINING UNSATURATED POLYESTERS

John R. Dombroski, and John R. Caldwell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 388,705, Aug. 15, 1973, abandoned. This application July 11, 1974, Ser. No. 487,691
Int. Cl.² C08G *63/20*
U.S. Cl. 260—475 P 2 Claims



1. A polyester consisting essentially of the following structure



wherein

based on the sum of *a*, *b* and *c* being 100 moles, *a* is from 44 to 47 moles, *b* is from 44 to 47 moles and *c* is from 6 to 12 moles,

d is 0 or 1, *e* is 0 or 1 and the sum of *d* and *e* = 1,

f is 0 or 1, *g* is 0 or 1 and the sum of *f* and *g* = 1,

e or *f* are at least 1, the molecular weight of the polyester is 4000 to 6000, and

the acid number of the polyester is 10 to 30.

3,929,869

PENTANOL DERIVATIVES

Martine Pierrette Benoit-Guyod; Jean-Louis Alain Benoit-Guyod, both of Grenoble; Andre Louis Boucherie, Corenc-Montfleury, and Pierre Luc Eymard, Fontaine, all of France, assignors to Labaz, Paris, France

Continuation of Ser. No. 374,530, June 28, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,380
Int. Cl.² C07C *125/04*
U.S. Cl. 260—482 C 2 Claims

1. 4-n-propyl-3-heptanol carbamate.

3,929,870
EMULSIFIERS DERIVED FROM HYDROXYCARBOXYLIC ACIDS

Reginald David, Lyon, and Jean Estienne, Ternay, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

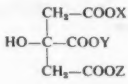
Filed May 28, 1974, Ser. No. 473,828

Claims priority, application France, May 30, 1973, 73.19733

Int. Cl.² C07C *69/68*

U.S. Cl. 260—484 A **11 Claims**

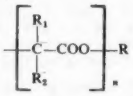
1. A citric acid ester of the formula:



in which each of X, Y and Z represents:

a. hydrogen, alkali metal, or ammonium; or

b. a radical of formula:



in which *n* is 1 to 2, R_1 and R_2, which may be identical or different, are each hydrogen or methyl, and R is a saturated or unsaturated aliphatic radical of 12 to 22 carbon atoms, one to two of X, Y and Z conforming to definition (a), and the remainder conforming to definition (b).

3,929,871
1-(3-HYDROXY-4-ALKYL-PHENYL)-ALKYLAMINES(-2) AND THE SALTS THEREOF

Per Arvid Emil Carlsson, Goteborg; Hans Rudolf Corrodi, Askim; Sven Göran Hallhagen, Molndal, and Ulf Krister Junggren, Goteborg, all of Sweden, assignors to Aktiebolaget Hassle, Gothenburg, Sweden

Division of Ser. No. 811,662, March 28, 1969, Pat. No. 3,655,737, which is a continuation of Ser. No. 171,017, Aug. 11, 1971, abandoned. This application June 21, 1973, Ser. No. 372,088

Claims priority, application Sweden, Apr. 1, 1968, 4332/68

Int. Cl.² C07C *87/29*

U.S. Cl. 260—501.17 **2 Claims**

1. 1-(3-hydroxy-4-ethyl-phenyl)-propylamine(-2 or their optical antipodes) or therapeutically acceptable salts thereof.

2. 1-(3-hydroxy-4-methyl-phenyl)-butylamine(-2) or their optical antipodes or therapeutically acceptable salts thereof.

3,929,872
INDANACETIC ACID COMPOUNDS

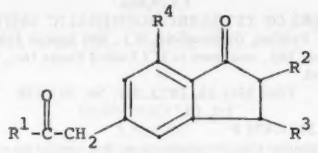
Edward J. Cragoe, Jr., Lansdale; Everett M. Schultz, Ambler, and Otto W. Woltersdorf, Jr., Chalfont, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 12, 1973, Ser. No. 405,966

Int. Cl.² C07C *63/595*

U.S. Cl. 260—515 R **8 Claims**

1. A compound having the formula:



wherein R^1 is hydroxy, alkali metal alkaline earth metal salts thereof and lower alkoxy; R^2 is hydrogen, lower alkyl and lower cycloalkyl; R^3 is hydrogen and lower alkyl and R^4 is hydrogen, lower alkyl or halogen.

3,929,873
OXIDATION OF POLYETHYLENE GLYCOLS TO DICARBOXYLIC ACIDS

William J. Gammans, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,764

Int. Cl.² C07C *51/26*

U.S. Cl. 260—531 R **16 Claims**

1. A process whereby a polyethylene glycol of the formula

$$HO—CH_2—CH_2—O+CH_2-CH_2-O+_nCH_2CH_2OH$$

where *n* is from 0 to 1, is oxidized directly to a dicarboxylic acid having the formula

$$HOOC-CH_2-O(CH_2-CH_2-O)_nCH_2-COOH$$

wherein *n* is as previously defined, in the presence of a platinum catalyst selected from the group consisting of finely divided platinum and platinum supported on carbon and an oxidizing gas.

3,929,874
AMINOHYDROXYPOLYCARBOXYLIC ACID COMPOUNDS

Claus Beermann, Wildsachsen, Taunus; Volker Knittel, Wiesbaden, and Walter Dürsch, Schneidhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

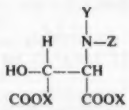
Filed Aug. 21, 1973, Ser. No. 390,321

Claims priority, application Germany, Aug. 22, 1972, 2241134

Int. Cl.² C07C *101/30*

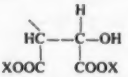
U.S. Cl. 260—534 M **4 Claims**

1. A compound of the formula

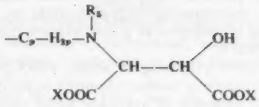


[(III)]

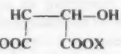
wherein Z is one of the groups $—CR_3R_4—COOX$,



or



wherein, if Z stands for the group



Y represents hydrogen or methyl, and for all the other variants of Z, Y is hydrogen, methyl or alkyl or hydroxyalkyl having 2 to 4 carbon atoms, and wherein X is hydrogen or an alkali metal, and R_3 and R_4 independently from each other representing hydrogen, alkyl or hydroxyalkyl having 1 to 4 carbon atoms, and R_4 furthermore representing the radical $-(CH_2)_m-COOX$, m being 1 to 4 and X having the above meaning, R_5 representing hydrogen or methyl, and p being 2 or 3.

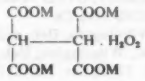
3,929,875

ETHANETETRACARBOXYLATE PERHYDRATES

John N. Rapko, St. Louis, and Marvin M. Crutchfield, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 15, 1974, Ser. No. 488,382
Int. Cl.² C07C *55/24*
U.S. Cl. 260—537 R 2 Claims

1. A compound represented by the formula



wherein M is alkali metal or ammonium.

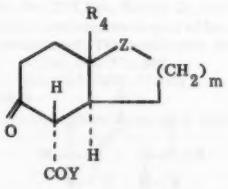
3,929,876

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 765,023, Oct. 4, 1968. This application June 24, 1974, Ser. No. 482,713
Int. Cl.² C07C *61/36*
U.S. Cl. 260—544 L 1 Claim

1. A compound of the formula



wherein R_4 is hydrogen or lower alkyl, Z is lower alkylenedioxy methylene or $CH(OR_3)$ where R_3 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl lower alkyl, tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxybenzoyl, trifluoroacetyl, or camphorsulfonyl, m is an integer having a value of 1 or 2 and Y is selected from the group consisting of chlorine, fluorine, bromine and iodine, its optical enantiomer and the racemate thereof.

3,929,877

PROCESS FOR THE PRODUCTION OF THIOCARBOHYDRAZIDE

Anton Toth, Obernburg; Hans-Dieter Rupp, Kassel-Bettenhausen, and Gerhard Meyer, Obernburg, all of Germany, assignors to Akzo N.V. of Arnhem, Holland, Arnhem, Netherlands

Filed Nov. 18, 1974, Ser. No. 524,931
Claims priority, application Germany, Nov. 26, 1973, 2358819
Int. Cl.² C07C *157/02*
U.S. Cl. 260—552 SC 8 Claims

1. In a process of the production of thiocarbohydrazide by the thermal treatment of hydrazinium-dithiocarbazinate in hydrazine hydrate as the reaction medium, the improvement which comprises carrying out said thermal treatment at a temperature of 20°C. to 85°C. in an aqueous or water-free hydrazine hydrate to which hydrogen sulfide has been added before said thermal treatment.

3,929,878

DECOMPOSITION OF AMMONIUM CARBAMATE

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Filed May 10, 1971, Ser. No. 237,644
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A 6 Claims

1. In the process for decomposing ammonium carbamate in an aqueous urea solution containing said carbamate, urea, water and ammonia, wherein said solution is charged to a lower section of a tube and shell decomposing vessel, wherein said solution is forced upwardly through and is heated in a tube of said vessel to a temperature at which the carbamate is decomposed with the formation of a liquid phase containing urea, wter, residual ammonium carbamate and residual ammonia, and a gaseous phase containing ammonia, carbon dioxide and water vapor, wherein said phases are discharged from said tube into an upper section of said decomposing vessel above the upper surface of the heat transfer chamber of said vessel, and wherein said gas phase is discharged through a discharge line positioned proximate the top of said upper section of said decomposing vessel, the improvement which comprises:

deflecting, in said upper section, said upwardly moving phases downwardly before said phases reach said discharge line, and

removing said liquid phase from an outlet located in said upper section at or below the upper extremity of said tube, thereby preventing substantially all of said liquid phase from reentering said tube.

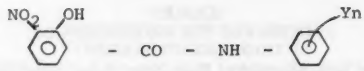
3,929,879

3-NITROHALOSALICYLANILIDES

Robert G. Taborsky, Bedford Heights, Ohio, assignor to Ben Venue Laboratories, Inc., Bedford, Ohio

Continuation-in-part of Ser. No. 469,300, July 2, 1965, abandoned, which is a continuation-in-part of Ser. Nos. 325,473, Nov. 21, 1963, abandoned, and Ser. No. 435,686, Feb. 26, 1965, abandoned, each is a continuation-in-part of Ser. No. 56,679, Sept. 19, 1960, abandoned. This application May 20, 1968, Ser. No. 730,596
Int. Cl.² C07C *103/76*
U.S. Cl. 260—559 S 9 Claims

1. A 3-nitrohalosalicylanilide having the formula



where Y is a halogen and *n* is a positive integer no greater than 5.

3,929,880

PROCESS FOR THE PREPARATION OF OXOCARBOXYLIC ACID AMIDES AND OXOCARBOXYLIC ACIDS

Richard Kirchlechner; Werner Rogalski, and Jurgen Seubert, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

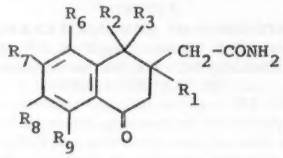
Division of Ser. No. 281,651, Aug. 18, 1972, Pat. No. 3,870,757. This application Jan. 3, 1974, Ser. No. 430,529

Claims priority, application Germany, Aug. 21, 1971, 2141947

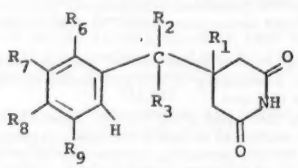
Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 A **3 Claims**

1. A process for the preparation of a cyclic oxo-carboxylic acid amide of the formula



wherein R_1 is H, CH_3 or n-C_3H_7, one of R_2 and R_3 is H and the other is H or CH_3 R_6, R_7, R_8 and R_9 for each H, F, Cl, Br, I, CH_3, i-C_3H_7, n-C_4H_9, CF_3 OH, OCH_3, OC_4H_9, $OCOCH_3$, NO_2, NH_2, $N(CH_3)_2$ or $NHCOCH_3$ with the provisions that at least two of R_6–R_9 are H and that not more than one of R_6–R_9 represents a substituent from the group consisting of F, Cl, Br, I, CF_3 and NO_2, which process comprises the step of reacting (i) a cyclic dicarboxylic acid imide of the formula



wherein R_1, R_2, R_3, R_6, R_7, R_8 and R_9 have the above-indicated meannings, with (ii) a Friedel-Crafts catalyst reactant to form said cyclic oxo-carboxylic amide.

3,929,881

PROCESS FOR HYDRATING A NITRILE TO THE CORRESPONDING AMIDE

Tokuzo Kurata; Takeshi Okano, both of Kitakyushu; Akio Tamaru; Yozo Kato, both of Yokohama, and Saburo Nagashima, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Aug. 31, 1973, Ser. No. 393,291

Claims priority, application Japan, Sept. 2, 1972, 47-88217; Sept. 4, 1972, 47-88531; Feb. 14, 1973, 48-18195

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **31 Claims**

1. A process for preparing an amide which comprises hydrating acrylonitrile or methacrylonitrile to the corresponding amide in the presence of a copper metal catalyst which is obtained by decomposing copper hydride by heating in a non-oxidizing atmosphere at a temperature from room temperature to 300°C.

8. A process of preparing an amide, which comprises: hydrating acrylonitrile or methacrylonitrile to the corresponding amide in the presence of a copper metal catalyst which is obtained by decomposing copper hydride by heating at a temperature from room temperature to about 100°C in a solvent.

15. A process for preparing an amide, which comprises: hydrating acrylonitrile or methacrylonitrile to the corresponding amide in the presence of a copper metal catalyst obtained by decomposing copper hydride by heating in a non-oxidizing atmosphere at a temperature from room temperature to 300°C in the presence of a promoter compound of an element selected from the group consisting of Si, V, Fe, Ti, or Zr.

23. A process for preparing an amide, which comprises: hydrating acrylonitrile or methacrylonitrile to the corresponding amide in the presence of a copper metal catalyst obtained by decomposing copper hydride by heating at a temperature from room temperature to about 100°C in a solvent in the presence of a promoter compound of an element selected from the group consisting of Si, V, Fe, Ti, or Zr.

3,929,882

N,N′,N″,N‴-TETRASUBSTITUTED MALONAMIDINES AND SALTS

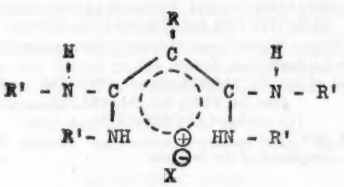
Frank Edward Herkes, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 13, 1972, Ser. No. 217,933

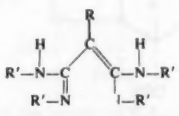
Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 R **16 Claims**

1. A compound selected from the group consisting of



and



wherein R and R′, alike or different, are selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl groups of 1 to 14 carbons and monosubstituted derivatives thereof in which the substituent is selected from the group consisting of alkoxy, perfluoroalkoxy, alkylthio, perfluoroalkylthio, dialkylamino, chlorine and fluorine, X is chlorine or fluorine, and the dotted line designates resonance.

3,929,883

PHENYLFORMAMIDINE DERIVATIVES

Dieter Dürr, Bottmingen, Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,461
Claims priority, application Switzerland, Mar. 29, 1972, 4730/72; Mar. 29, 1972, 4731/72
Int. Cl.² C07C *123/00*
U.S. Cl. 260—564 RF 2 Claims

1. N,N-dimethyl-N'-(2-methyl-6-ethyl-phenyl)-formamidine.

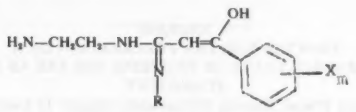
3,929,884

INTERMEDIATES IN THE SYNTHESIS OF 5-ALKYLAMINO-7-PHENYL OR SUBSTITUTED PHENYL-2,3-DIHYDRO-1H-1,4-DIAZEPINES

William R. J. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Mar. 29, 1974, Ser. No. 456,017
Int. Cl.² C07C *123/00*
U.S. Cl. 260—564 R 7 Claims

1. A compound of the formula



or an acid addition salt thereof,
wherein
R is alkyl of 1 to 6 carbon atoms,
each X is independently alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo, and
m is 0, 1 or 2.

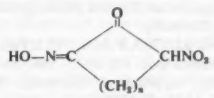
3,929,885

PROCESS FOR THE MANUFACTURE OF KETONE DERIVATIVES

Robert Fuhrmann, Morris Plains; Stylianos Sifniades, Madison, and Allen Abraham Tunick, Denville, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

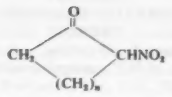
Division of Ser. No. 237,886, March 24, 1972, Pat. No. 3,758,851, which is a continuation-in-part of Ser. No. 852,881, Aug. 25, 1969, abandoned. This application June 20, 1973, Ser. No. 371,908
Int. Cl.² C07C *131/02*
U.S. Cl. 260—566 A 9 Claims

1. A process for the preparation of a compound of the structure:



wherein *n* is an integer ranging from 2 to 9 comprising the steps of:

a. forming an at least 10 wt.% solution of an α-nitroketone of the structure:

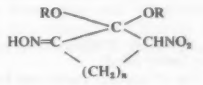


wherein *n* is as defined above in liquid SO_2;

b. admixing with said solution at a temperature ranging from about −30°C. to +25°C., at least about 1.0 mole per mole of said α-nitroketone of a nitrosating agent selected from the group consisting of C_1 to C_4 alkyl nitrites, N_2O_3, nitrosyl formate, nitrosyl chloride and nitrosyl bromide and when said nitrosating agent is N_2O_3, nitrosyl formate, nitrosyl chloride or nitrosyl bromide, at least 1.0 mole of an alkanol ROH per mole of α-nitroketone wherein R is a C_1 to C_4 alkyl group, and at least about 4.0 moles of a strong acid per mole of said α-nitroketone;

c. separating from the thereby formed hemi-ketal reaction product sulfur dioxide, acid, and any unreacted nitrosating agent and alkanol;

d. reacting said reaction product with at least about 1.0 mole of an alkanol ROH per mole of reaction product to thereby afford a ketal of the structure:



wherein R and *n* are as defined above;

e. reacting said ketal with at least one equivalent of base to afford an enol salt; and

f. neutralizing said enol salt.

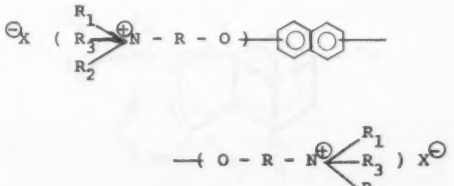
3,929,886

QUATERNARY AMMONIA SALTS OF POLYHALOGENATED AROMATIC COMPOUNDS

Arsene Isard, Grenoble, and Ludovic Parvi, Pont-de-Claix, both of France, assignors to Products Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 17,935, March 9, 1970, abandoned. This application Mar. 15, 1973, Ser. No. 341,374
Claims priority, application France, Mar. 18, 1969, 69.07630
Int. Cl.² C07C *93/08*
U.S. Cl. 260—567.6 P 6 Claims

1. Quaternary ammonium salts corresponding to the general formula:



in which the biphenyl radical is polyhalogenated; R is a lower alkylene group; R_1, R_2 and R_3 each represents an unsubstituted alkyl or cycloalkyl radical, or a halogen substituted alkyl or cycloalkyl radical, or a lower alkyl substituted cycloalkyl radical; and X^- is a halide, an alkylsulfate containing from 1 to 20 carbon atoms or an arylsulfonate anion.

3,929,887

ALKYLENEPOLY(ARALKYLAMINES) AND THE SALTS THEREOF

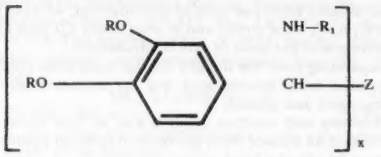
Leonard J. Fliedner, Jr., Flushing, and Irwin J. Pachter, Woodbury, both of N.Y., assignors to Endo Laboratories, Garden City, N.Y.

Continuation of Ser. No. 38,529, May 18, 1970, which is a continuation-in-part of Ser. No. 735,510, June 10, 1968, abandoned. This application July 24, 1972, Ser. No. 274,486

Int. Cl.² C07C *87/20*

U.S. Cl. 260—570.5 P 6 Claims

1. A compound of the formula



wherein

R is lower alkyl, phenyl or benzyl;

R_1 is hydrogen or lower alkyl;

Z is alkylene of 7 to 15 carbon atoms and having a valence of *x*; and *x* is 3 or 4; and the acid addition salts thereof.

3,929,888

2-PHENYL-ADAMANTANEALKYLAMINE COMPOUNDS AND THEIR SALTS

Colin H. Cashin; Jiban K. Chakrabarti, both of Frimley, England, and Stephen S. Szinai, Gainesville, Fla., assignors to Lilly Industries, Ltd., London, England

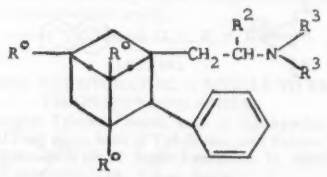
Continuation-in-part of Ser. No. 852,090, Aug. 21, 1969, abandoned. This application Nov. 19, 1973, Ser. No. 417,174

Claims priority, application United Kingdom, Aug. 27, 1968, 40968/68

Int. Cl.² C07C *87/29*

U.S. Cl. 260—570.5 CA 5 Claims

1. The compound selected from those compounds of the following formula and their pharmaceutically acceptable acid addition salts:



wherein each R^0 independently represents hydrogen or methyl; R^2 represents hydrogen or alkyl of C_1–C_4; and each R^3 independently represents hydrogen, alkyl of C_1–C_4, or 2-hydroxyethyl, subject to the limitation that at least one of R^2 and R^3 is other than hydrogen.

3,929,889

SYNTHESIS OF AROMATIC AMINES BY REACTION OF AROMATIC COMPOUNDS WITH AMMONIA

Edward Noonan Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 115,774, Feb. 16, 1971, abandoned, and Ser. No. 99,636, Dec. 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 22,716, March 25, 1970, abandoned. This application Dec. 19, 1973, Ser. No. 429,023

Int. Cl.² C07C *85/18*

U.S. Cl. 260—571 13 Claims

1. A process for aminating an aromatic compound selected from the group consisting of diphenyl ether, monamino derivatives thereof, benzene, aniline and toluene, said process comprising reacting ammonia with the aromatic compound at a temperature of from 150°C. to 500°C. and at a pressure of from 10 to 1000 atmospheres in the presence of a nickel/nickel oxide cataloreactant which has been partially reduced to elemental nickel and thereafter oxidized to form a cataloreactant having a mole ratio of nickel to nickel oxide of 0.001:1 to 10:1, said ammonia and aromatic compound being in intimate contact with said cataloreactant.

3,929,890

PROCESS FOR THE PREPARATION OF A HYDROLYZATE OF PROTEINS FOR USE AS A FOODSTUFF

Bernard Pfister, Lucens, Switzerland, assignor to Union Laitiere Vaudoise, Switzerland

Filed Jan. 24, 1973, Ser. No. 326,162

Claims priority, application Switzerland, Jan. 27, 1972, 1219/72

Int. Cl.² A23J *3/00*

U.S. Cl. 426—580 7 Claims

1. A process for the preparation of a hydrolyzate of proteins for use as a foodstuff, comprising the steps of: providing a mixture of water, purified arsenic-free hydrochloric acid of density approximately 1.17 and proteins in a proportion by weight of approximately 9:13:10; boiling said mixture for several hours and then cooling to a temperature between 28° and 32°C; neutralizing the mixture by the progressive addition of a base to bring the pH to a value between 6.5 – 6.75 while maintaining said temperature range, then cooling the neutralized mixture to a temperature between 15° and 25°C; filtering the neutralized mixture to separate the clear filtrate and drying said clear filtrate to a solid product.

3,929,891

REDUCTION OF HALONITROAROMATES USING SULFITED PLATINUM ON CARBON CATALYSTS

Kurt Habig, and Konrad Baessler, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

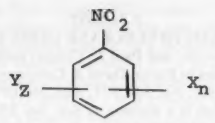
Division of Ser. No. 223,783, Feb. 4, 1972, Pat. No. 3,803,054. This application Dec. 10, 1973, Ser. No. 423,298

Claims priority, application Germany, Feb. 8, 1971, 2105682; Feb. 8, 1971, 2105780

Int. Cl.² C07C *85/11*

U.S. Cl. 260—580 1 Claim

1. In a process for the hydrogenation of a halonitroaromate of the formula



wherein

X is halogen,

Y is hydrogen, trifluoromethyl or alkyl or alkoxy of 1 to 4 carbon atoms each, and

Z and n are each 1 to 3 with the proviso that the sum of Z and *n* does not exceed 5;

the improvement comprising hydrogenating the halonitroaromate in the presence of a catalyst obtained by suspending a particulate platinum on carbon catalyst having an effective surface of at least 800 m²/g in an aqueous medium of a pH in the range of 0 to 5, saturating with hydrogen at a pressure in the range of normal pressure to 1 atmg, admixing with 0.3 to 0.7 mol of a sulfitizing agent per each mol of hydrogen absorbed and isolating the catalyst from the aqueous medium.

3,929,892

PREPARATION OF A LOW FAT CREAM CHEESE PRODUCT

John T. Hynes, Glenview, Ill., and Demetrius G. Vakaleris, Lima, Ohio, assignors to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 311,315, Dec. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 74,937, July 23, 1970, abandoned. This application May 29, 1974, Ser. No. 474,175

Int. Cl.² A23C *19/00, 19/12*

U.S. Cl. 426—582 **9 Claims**

1. A method for making a cheese product having a body and texture similar to that of Cream cheese, but having less fat than Cream cheese, comprising providing a mixture of water and Cottage cheese curd, adding a fat source to said mixture to provide a substrate, adding non-fat milk solids to said substrate, at least about 4 percent to about 22 percent of the protein of said substrate being denatured serum proteins, heating said substrate to a temperature of about 140°F to about 180°F sufficient to provide a fluid mix and to effect pasteurization, adding an edible acid to said heated mixture, and homogenizing said acidified substrate at a pressure sufficient to establish a final product having a penetration firmness within the range of from about 30 to about 50, to provide a cheese product having a body and texture similar to that of Cream cheese, but having less fat than Cream cheese, said Cottage cheese curd being present at a level of from about 15 percent to about 65 percent by weight of said cheese product, said fat source being provided at a level sufficient to establish from about 10 percent to about 20 percent by weight fat in said cheese product, said non-fat milk solids being present at a level of from about 5 percent to about 15 percent by weight of said cheese product, the level of lactose in said cheese product being from about 4 percent to about 7 percent, said acid being added at a level sufficient to establish a pH of from about 4.3 to about 4.8 in said substrate.

3,929,893

PROCESS FOR PREPARING CYCLOHEXADECENONE-5

Ikuzi Kumasa; Takeshi Yamamoto; Fumitaka Norose, all of Yokohama; Susumu Acutagawa, Tokyo; Toshio Yoshida, Yokohama, and Akira Komatsu, Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 213,718, Dec. 29, 1971, abandoned. This application Feb. 21, 1974, Ser. No. 444,596

Claims priority, application Japan, Dec. 29, 1970, 46-126904

Int. Cl.² C07C *45/00, 29/00*

U.S. Cl. 260—586 R **7 Claims**

1. A process for preparing cyclohexadecenone-5 consisting of:

1. reacting cyclododecanone with a chlorinating agent to produce α-chloro-cyclododecanone-1;
2. reacting 1 mole of the resulting α-chloro-cyclododecanone-1 with 1 mole of vinyl magnesium chloride at room-temperature for 1 hour in tetrahydrofuran as a solvent and thereafter adding a catalytic amount of aluminum isopropoxide followed by reacting the resulting reaction product with 1 more mole of vinyl magnesium chloride at about 60°C. for from 2 to 3 hours;
3. hydrolyzing the reaction product of step (2) to produce 1.2-divinyl cyclododecanol-1; and
4. thermally rearranging said 1,2-divinylcyclododecanol-1 by heating at a temperature of from 180°–250°C. under an inert gas atmosphere to produce said cyclohexadecenone-5.

3,929,894

PROCESS FOR THE PREPARATION OF ISOPROPENYL-BICYCLO[4,4,0]DEC-1-EN-3-ONES

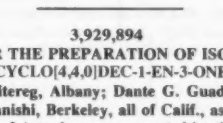
Theodore J. Leitereg, Albany; Dante G. Guadagni, Moraga, and Roy Teranishi, Berkeley, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 113,678, Feb. 8, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 459,160

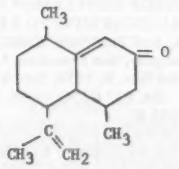
Int. Cl.² C07C *45/00, 49/54*

U.S. Cl. 260—586 P **1 Claim**

1. A method for preparing a mixture of the compounds



and



and including stereoisomers of each of these compounds, and wherein the stereoisomers of the second-designated compound comprises the major proportion of the mixture, which comprises:

a. condensing dihydrocarvone with 3-penten-2-one in the presence of pyrrolidine in a solvent selected from the

group consisting of benzene, toluene, tetrahydrofuran, and t-amyl alcohol, said condensation being carried out under reflux at a temperature of about 60° to 120° C., and b. treating the resulting condensation product with potassium tert-butoxide in dimethylsulfoxide at room temperature.

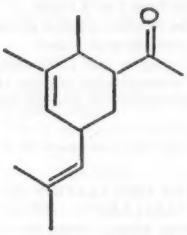
3,929,895

4-ACETYL-2,3-DIMETHYL-6-ISOPROPENYLMETHYL-CYCLOHEXENE

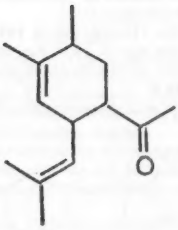
John B. Hall, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 22, 1974, Ser. No. 462,750
Int. Cl.² C07C *49/61*
U.S. Cl. 260—586 R 1 Claim

1. A mixture of chemical compounds having the structures:



and



3,929,896

SINGLE STAGE CONVERSION OF SECONDARY HALOCARBONS TO KETONES

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 9, 1970, Ser. No. 88,231
Int. Cl.² C07C *49/06, 49/26*
U.S. Cl. 260—593 R 14 Claims

1. The process for the production of a ketone by the reaction of sulfur and water with a halocarbon feed which comprises contacting the feed in the liquid phase with water and sulfur at a temperature in the range from about 225°C. to 325°C. for a period of less than about two hours, wherein for each mol of the feed there is present from about 0.5 to 200 mols water and from about 0.15 to 2 mols sulfur, said feed comprising at least one compound of the formula R_2CHX, wherein R is an alkyl or cycloalkyl group; and wherein X is a halogen having an atomic number below 54; said compound having a carbon atom content of one to 25.

3,929,897

TETRAMETHYLALKANE DERIVATIVES

George W. Moersch, and Paul L. Creger, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Division of Ser. No. 327,977, Jan. 30, 1973, Pat. No. 3,857,884, which is a division of Ser. No. 29,704, April 17, 1970, Pat. No. 3,742,068. This application Sept. 20, 1974, Ser. No. 507,633
Int. Cl.² C07C *47/02*
U.S. Cl. 260—602 1 Claim

1. The compound 2,2,9,9-tetramethyldecanedial.

3,929,898

PRODUCTION OF MAINLY LINEAR ALDEHYDES

Hans-Juergen Nienburg, Ludwigshafen; Rudolf Kummer, Frankenthal; Heinz Hohenschutz, Mannheim; Max Strohmeyer, and Peter Tavs, both of Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 1, 1972, Ser. No. 276,936
Claims priority, application Germany, Aug. 7, 1971, 2139630; Feb. 10, 1972, 2206252
Int. Cl.² C07C *45/08*
U.S. Cl. 260—604 HF 10 Claims

1. A process for the production of mainly linear aldehydes by hydroformylation of an olefinically unsaturated compound of from two to twenty carbon atoms with carbon monoxide and hydrogen at elevated temperature and superatmospheric pressure in the presence of a cobalt carbonyl complex prepared prior to the hydroformylation from an aqueous solution of a cobalt salt, wherein in a first stage an aqueous solution of a cobalt salt is treated with carbon monoxide and hydrogen at a temperature of from 50° to 200°C and at a pressure of from 100 to 400 atmospheres in the presence of activated carbon, a zeolite or a basic ion exchanger containing primary, secondary, tertiary or quaternary amino groups; the aqueous solution containing cobalt salt and cobalt carbonyl hydride thus obtained and the mixture of carbon monoxide and hydrogen, without releasing the pressure, are extracted at a temperature of 20° to 100°C and at a pressure of 100 to 400 atmospheres in a second stage with the olefinically unsaturated compound used for the hydroformylation, which compound is liquid under the conditions used and is insoluble in water, or with an organic solvent containing said olefinically unsaturated compound, which solvent is liquid under the conditions used and is insoluble in water; the aqueous phase is separated and the organic phase containing the carbonyl complex thus obtained and the mixture of carbon monoxide and hydrogen are transferred to a third stage; and, after supplying additional olefinically unsaturated compounds, if only a portion of the olefin to be used in the hydroformylation was used for the extraction in the second stage, hydroformylation is carried out in the third stage at a temperature of from 70° to 170°C and a pressure of from 100 to 400 atmospheres to obtain an oxo reaction product composed mainly of linear aldehydes.

3,929,899

PROCESS FOR THE OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES AND CATALYSTS THEREFORE

Robert K. Grasselli, Chagrin Falls, and Maria S. Friedrich, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 205,706, Dec. 7, 1971, which is a continuation-in-part of Ser. No. 16,984, March 5, 1970, Pat. No. 3,666,823, which is a continuation of Ser. No. 691,992, Dec. 20, 1967, Pat. No. 3,544,616. This application Dec. 10, 1973, Ser. No. 423,494
Int. Cl. C07c *45/04*
U.S. Cl. 260—604 R 2 Claims

1. The process for the oxidation of propylene and isobutylene to form acrolein and methacrolein, respectively, which comprises contacting in the vapor phase at a temperature

within the range from about 500°F to about 1100°F a mixture of a molecular oxygen-containing gas and either propylene or isobutylene, or mixtures thereof, in a molar ratio of oxygen to olefin within the range from about 0.5:1 to about 5:1, in the presence of a supported catalyst composition of the empirical formula $U_x As_y O_z$ wherein x is a number within the range from 1 to 25; y is a number within the range from 1 to 10; and z is a number taken to satisfy the oxidation state of the elements in said catalyst composition.

3,929,900
CONTINUOUS PROCESS FOR THE PRODUCTION OF OXYGEN CONTAINING COMPOUNDS

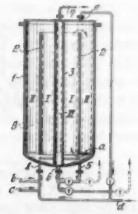
Friedrich Schnur; Josef Hibbel, both of Oberhausen, and Boy Cornils, Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 14, 1973, Ser. No. 424,988

Claims priority, application Germany, Dec. 27, 1972, 2263498

Int. Cl.² C07C *45/08*

U.S. Cl. 260—604 HF **26 Claims**



1. In a process for forming an aldehyde and/or alcohol by the Oxo-process wherein an olefinically unsaturated hydrocarbon is reacted with carbon monoxide and hydrogen in the presence of a Group VIII B catalyst, the improvement which comprises introducing said olefinically unsaturated hydrocarbon, said hydrogen, carbon monoxide and catalyst into the bottom of a first reaction zone and allowing the reactants to rise in said first reaction zone, passing liquid reactants from the top of said first reaction zone into the top of a second reaction zone, allowing a portion of the liquid reaction mixture from second reaction zone to enter the bottom of said first reaction zone, withdrawing liquid reaction mixture from the bottom of said second reaction zone withdrawing gaseous reactants from said first and/or second reaction zone.

3,929,901
DIHALOPHENYL-BIS-(HYDROXYARYLETHERS)

Gerhard Darsow, Krefeld-Uerdingen; Ludwig Bottenbruch, Krefeld-Bocku, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

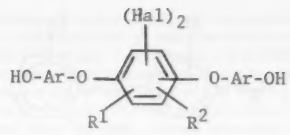
Continuation of Ser. No. 228,345, Feb. 22, 1972, abandoned, which is a continuation of Ser. No. 825,398, May 16, 1969, abandoned. This application July 19, 1973, Ser. No. 380,701

Claims priority, application Germany, June 1, 1968, 1768595

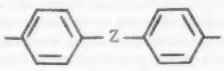
Int. Cl.² C07C *147/06*, *43/22*

U.S. Cl. 260—607 A **6 Claims**

1. Aryl ethers of the formula



wherein R^1 and R^2 are hydrogen; Hal is chlorine or bromine; and Ar is selected from the group consisting of phenylene, diphenylene and



wherein Z is 2,2-isopropylene or $—SO_2—$.

3,929,902
1-PHENYL-2, 3-BUTADIEN-1-OLS

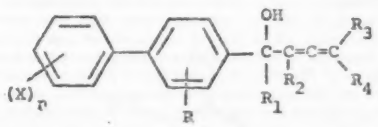
Eugene E. Galantay, Liestal, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 219,129, Jan. 19, 1972, abandoned. This application Oct. 11, 1973, Ser. No. 405,478

Int. Cl.² C07C *43/20*, *35/02*

U.S. Cl. 260—612 R **20 Claims**

1. A compound of the formula



wherein

R is a hydrogen atom, or halo having an atomic weight from about 19 to 80;

R_1 is a hydrogen atom or alkyl of 1 to 3 carbon atoms;

R_2 is a hydrogen atom or methyl;

R_3 and R_4 are, independently, a hydrogen atom or alkyl of 1 to 3 carbon atoms, provided that at least one of R_2 and R_4 is a hydrogen atom when R_2 is methyl;

X is a hydrogen atom, halo having an atomic weight of from about 19 to 80, or alkoxy having from 1 to 4 carbon atoms; and

n is an integer from 1 to 5.

3,929,903
GERMICIDAL AND FUNGICIDAL DIPHENYL ETHERS

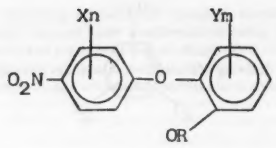
Teruhisa Noguchi; Yoshinobu Hashimoto, both of Fujisawa; Yoshio Uchiyama, Takaoka, and Michio Ueyama, Tokyo, all of Japan, assignors to Nippon Soda Company, Ltd., Tokyo, Japan

Division of Ser. No. 344,446, March 23, 1973, abandoned. This application July 26, 1974, Ser. No. 492,151

Int. Cl.² C07C *43/22*

U.S. Cl. 260—613 R **4 Claims**

1. A germicidal and fungicidal agent represented by the following general formula:



wherein each X represents a halogen atom, selected from the group consisting of chlorine and bromine, and whem *m* is a plural number Y may represent more than one kind of said halogen atom; R is selected from the group consisting of a hydrogen atom and a sodium atom, *n* expresses zero to 1, *m* expresses zero or an integer of not more than 3, and *m* and *n* cannot both be zero.

3,929,904

PROCESS FOR THE SELECTIVE ALLYLATION OF ORTHO ALKOXY PHENOLS

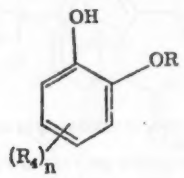
Robert S. De Simone, Willingboro, and Hugh E. Ramsden, Scotch Plains, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 244,958, April 17, 1974, abandoned. This application Aug. 16, 1974, Ser. No. 497,981

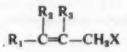
Int. Cl.² C07C *41/00*

U.S. Cl. 260—613 D **25 Claims**

1. A process for preparing an ortho-alkoxy-para allyl phenol which comprises allylating an ortho-alkoxy-phenol having the formula:

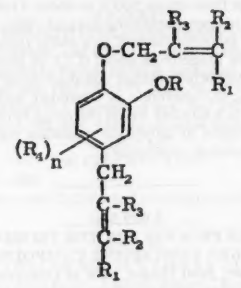


wherein R is an alkyl group having from one to about six carbon atoms, and R_4 is selected from the group consisting of hydrogen and methyl, *n* is an integer from one to three, and R_4 when methyl is not in the para position, with an allyl compound having the formula:

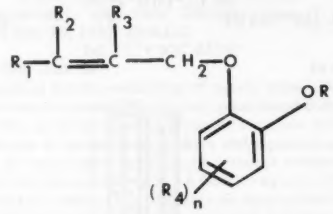


wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen and alkyl groups having from one to about six carbon atoms, and X is selected from the group consisting of halogen, sulfonate and sulfate, at a reaction temperature within the range from about 5° to about 150° C in the presence of an aqueous solution of an alkali or alkaline earth metal hydroxide; acidifying the reaction mixture; and recovering the allylated reaction product.

15. A process for the cleavage of the allyloxy group from 1-allyloxy-2-alkoxy-phenyl-ethers and 1-allyloxy-2-alkoxy-4-allyl-phenyl ethers substantially without cleavage of the 2-alkoxy ether group, which comprises reacting a 1-allyloxy-2-alkoxy-4-allyl-phenyl-ether having the formula:



and a 1-allyoxy-2-alkoxy-phenyl ether having the formula:



wherein R is an alkyl group having from one to about six carbon atoms; R_1, R_2 and R_3 are selected from the group consisting of hydrogen and alkyl groups having from one to about six carbon atoms, and R_4 is selected from the group consisting of hydrogen and methyl, n is an integer from 1 to 3, and R_4 when methyl is not in the para position, which comprises reacting the 1-allyloxy-2-alkoxy-phenyl-ether with alkali metal at a temperature within the range from about 50° to about 250°C to form the corresponding 2-alkoxy phenol.

3,929,905

CHLOROMETHYL 1,1-DIMETHYL-2-PROPYNYL ETHER AND PROCESS

Barrington Cross, Rocky Hill, and Charles Paul Grasso, Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 7, 1974, Ser. No. 440,631

Int. Cl.² C07C *43/14*

U.S. Cl. 260—614 R **1 Claim**

1. Chloromethyl 1,1-dimethyl-2-propynyl ether.

3,929,906

CHLOROPHENYL-BUTADIENOLS

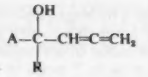
Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 28, 1973, Ser. No. 429,664

Int. Cl.² C07C *35/21*

U.S. Cl. 260—618 D **5 Claims**

1. The compound of the formula



wherein

R is a hydrogen atom, methyl or ethyl; and

A is either ortho-chlorophenyl or meta-chlorophenyl.

3,929,907

HALOGENATION OF PHENOLIC COMPOUNDS

Karl Heinz Janzon, Grossauheim; Wolfgang Weigert, Offenbach; Hilmar Hein, Wiesbaden-Kohlheck; Helmut Mechler, Hofheim, and Eugen Meyer-Simon, Frankfurt, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed June 1, 1973, Ser. No. 365,975

Claims priority, application Germany, June 6, 1972, 2227439

Int. Cl.² C07C *17/02, 37/00*

U.S. Cl. 260—619 R **22 Claims**

1. In a process of halogenating a phenol selected from the group consisting of (1) a phenol having 1 to 2 phenolic hydroxyl groups as the sole substituents, (2) benzene having one hydroxyl substituent and one aldehydo, carboxylic acid or sulfonic acid substituent as the sole substituents, (3) p-aminophenol, (4) p-nitrophenol, (5) o-nitrophenol, (6) p-fluorophenol, (7) p-chlorophenol and (8) o-bromophenol with chlorine or bromine in the liquid phase the improvement comprising carrying out said halogenation in the presence of aqueous hydrogen peroxide at a temperature of 0° to 100°C. and recovering the halogenated phenol formed.

3,929,908

BROMINATED BIPHENOLS

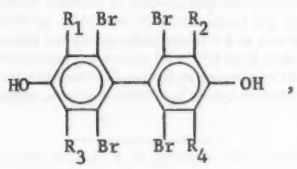
Charles M. Orlando, and Francois A. Lavallee, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,517

Int. Cl.² C07C *39/24*

U.S. Cl. 260—620 **6 Claims**

1. A chemical compound of the formula



where independently each R_1, R_2, R_3 and R_4 is a normal methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl or octyl.

3,929,909

PROCESS FOR THE PREPARATION OF A PHENOL FROM A BENZENEMONOCARBOXYLIC ACID

Laurentius L. van Dierendonck, and Johan P. H. Von den Hoff, both of Geleen, Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Jan. 18, 1971, Ser. No. 106,959

Claims priority, application Netherlands, Jan. 17, 1970, 7000684

Int. Cl.² C07C *37/00*

U.S. Cl. 260—621 R **10 Claims**

1. In a process for the preparation of a phenol by pyrolytic oxidation, decarboxylation and hydrolysis in the liquid phase of a benzenemonocarboxylic acid member selected from the group consisting of benzoic acid, substituted benzoic acid, salts, esters and anhydrides of said benzoic and substituted benzoic acids with oxygen in the presence of dissolved copper, the improvement comprising avoiding accummulation of tar or tar products in the reaction apparatus by limiting the oxidation reaction to the point that the reaction mixture still contains at least about 30 mole percent unreacted carboxylic acid, discharging at least part of the reaction mixture from the reaction apparatus, separating the tar and tar products therefrom by dissolving the withdrawn reaction mixture in a water-immiscible, organic solvent, adding water to the organic solution to separate copper salts from the organic solution, wherein the amount of water added is only that amount to form hydrates of the copper salts, which then precipitate as solids, fractionally distilling the remaining organic solution to separate the water-immiscible organic solvent, the unconverted reaction mixture containing benzenemonocarboxylic acid and the tar-containing remainder from each other.

3,929,910

PROCESS FOR SEPARATING RESORCINOL FROM HYDROQUINONE

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 19, 1973, Ser. No. 417,191

Claims priority, application Japan, Nov. 21, 1972, 47-117447

Int. Cl.² C07C *37/22, 37/26*

U.S. Cl. 260—621 B **2 Claims**

1. A process of separating resorcinol and hydroquinone from their admixture to obtain a hydroquinone-rich fraction and a resorcinol-rich fraction which contains greater than approximately 85% resorcinol based on the weight of the resorcinol and hydroquinone present in the resorcinol-rich fraction which comprises heating a mixture of resorcinol and hydroquinone at any mixing ratio with 15 to 30% by weight of an aqueous methanol solution containing 5 to 50% by weight of water, based on the total of the admixture and the aqueous methanol solution, cooling to a temperature of −10° to 30°C to form a slurry, and separating the resulting slurry into a resorcinol-rich mother liquor which contains greater than approximately 85% by weight resorcinol and a hydroquinone-rich-crystal fraction.

3,929,911

PREPARATION OF A PHENOL FROM A BENZENEMONOCARBOXYLIC ACID

Laurentius L. van Dierendonck, and Johan P. H. Von den Hoff, both of Geleen, Netherlands, assignors to Stamicarbon N.V., Geleen, Netherlands

Filed Jan. 18, 1971, Ser. No. 106,958

Claims priority, application Netherlands, Jan. 17, 1970, 7000685

Int. Cl.² C07C *37/00*

U.S. Cl. 260—621 R **4 Claims**

1. In a process for the continuous preparation of a phenol by pyrolytic oxidation and decarboxylation of a benzenemonocarboxylic acid compound selected from the group consisting of benzoic acid, substituted benzoic acid, and esters, anhydrides and salts of benzoic acid and substituted benzoic acid comprising oxidizing said benzenemonocarboxylic acid compound in the liquid phase with molecular oxygen, in the presence of dissolved copper, forming an intermediate reaction mixture containing an ester product which is subsequently hydrolyzed to the phenol, the improvement comprising feeding the intermediate reaction mixture from the oxidation zone, together with steam at a temperature of approximately 200°C. to a hydrolysis zone and introducing into the hydrolysis zone sufficient molecular oxygen to maintain the

copper in a bivalent state of oxidation in the reaction mixture, whereby the copper is maintained in solution in the reaction mixture during the hydrolysis step.

3,929,912

ALKYLATION OF HYDROXY-SUBSTITUTED AROMATIC COMPOUNDS

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 40,454, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 686,690, Nov. 29, 1967, abandoned. This application Dec. 22, 1972, Ser. No. 317,871

Int. Cl.² C07C *39/06*

U.S. Cl. 260—624 C 6 Claims

1. In a process for the liquid phase alkylation of a hydroxy-substituted aromatic compound by condensing said compound with an aliphatic mono-olefinic hydrocarbon of from 2 to 20 carbon atoms at a temperature in the range of from about −20° to about 150° C. and a pressure in the range of from about 10 to about 2,000 pounds per square inch, said aromatic compound being selected from the group consisting of phenol, poly-hydric phenols, monoalkyl mono-hydric phenols and polyalkyl mono-hydric phenols each of said alkyls containing from 1 to 3 carbon atoms, the improvement which comprises effecting the condensation of said aromatic compound and hydrocarbon in the presence of a hydrogen fluoride-carbon dioxide complex consisting essentially of carbon dioxide and from about 0.1 about 95 weight percent hydrogen fluoride.

3,929,913

PROCESS FOR PREPARING DIPHENOLS

Paolo Maggioni, Cernusco Montevecchia (Como), Italy, assignor to Brichima S.p.A., Milan, Italy

Filed Feb. 5, 1974, Ser. No. 439,713

Claims priority, application Italy, Feb. 16, 1973, 20497/73

Int. Cl.² C07C *37/00*

U.S. Cl. 260—621 G 8 Claims

1. Process for the preparation of pyrocatechin and hydroquinone as a mixture prevailing in pyrocatechin, comprising hydroxylating phenol with a 30 to 60% aqueous solution of hydrogen peroxide having a molar ratio of phenol: hydrogen peroxide of greater than 2 at atmospheric pressure and at a temperature of from 0-100°C. in the presence of a catalyst selected from the group consisting of dicyclopentadyeniliron, 1,1′-diacetyl-ferrocene, 1,1′-dibenzoyl ferrocene, di-n-butyl-ferrocene, ferrocendicarboxylic acid in an amount greater than 10 ppm by weight of catalyst per million parts by weight of phenol.

3,929,914

PROCESS FOR PREPARING A POLYCARBOXYDIENE POLYMER

Jihei Inomata, Komae; Seiichi Hino, and Tatsuo Tani, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 276,788, July 31, 1972. This application Apr. 1, 1974, Ser. No. 456,654

Int. Cl.² C08D *5/02*, *1/20*

U.S. Cl. 260—635 E 6 Claims

1. A process for preparing a liquid polycarboxydiene polymer, which comprises:

reacting a saturated polycarboxylic acid, anhydride, ester or acid halide with a polyhydroxydiene polymer having pendant and terminal hydroxy goups obtained from the reaction of 1 mole of a living polymer having a molecular weight of 500 to 10,000 which is prepared by reacting a conjugated diolefin or a mixture of the conjugated diolefin and a vinyl compound having the formula:

$CH_2 = CR_1 R_2$

wherein R_1 represents a hydrogen atom or an alkyl group and R_2 represents an aryl group or a pyridyl group in the presence of sodium or lithium metal or an organo sodium or lithium compound with 0.5 mole to 2 moles of epichlorohydrin, epibromohydrin, epifluorohydrin, chlorobutylene oxide or bromobutylene oxide.

3,929,915

PROCESS FOR THE PRODUCTION OF BUTANEDIOL

Charles C. Cumbo, Wilmington, and Kamlesh K. Bhatia, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed July 31, 1974, Ser. No. 493,740

Int. Cl.² C07C *29/16*

U.S. Cl. 260—635 E 11 Claims

1. A three-step process for preparing a 1,4-butanediol which comprises reacting acrolein with 2-methyl-1,3-propanediol under conventional conditions to produce 2-vinyl-5-methyl-1,3-dioxane, hydroformylating the 2-vinyl-5-methyl-1,3-dioxane under conventional conditions to produce the corresponding aldehyde of 2-vinyl-5-methyl-1,3-dioxane and then hydrolyzing and hydrogenating the aldehyde of 2-vinyl-5-methyl-1,3-dioxane under conventional conditions to obtain a mixture of 1,4-butanediol and 2-methyl-1,3-propanediol.

3,929,916

PROCESS FOR THE MONONITRATION OF ORTHO-XYLENE

Stephen David Levy, Trenton, N.J., and Francis Clyde Rauch, Warrington, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,189

Int. Cl.² C07C *79/10*

U.S. Cl. 260—645 7 Claims

1. A process of mononitrating o-xylene which comprises the steps of: reacting at least equimolar amounts of o-xylene, concentrated nitric acid of at least 68% and a lower aliphatic monocarboxylic acid anhydride in the presence of both catalytic amounts of nitrogen dioxide or nitrogen tetroxide and a mercury salt at a temperature of from 25°C. to 80°C. for from about 1.5 hours to 8.0 hours, maintaining the nitric acid concentration to at least 68%, and recovering mononitro-o-xylene in good yield and having an isomer distribution ratio of at least 70:30 of 4-nitro-o-xylene to 3-nitro-o-xylene, respectively.

3,929,917

PROCESS FOR THE MONONITRATION OF ORTHO-XYLENE

Francis Clyde Rauch, Warrington, Pa.; Anthony Joseph Fanelli, Rockaway, N.J., and Gerlinde Metzler Blank, Wilton, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 11, 1974, Ser. No. 478,190

Int. Cl.² C07C *79/10*

U.S. Cl. 260—645 7 Claims

1. A process for mononitrating o-xylene which consists essentially in the steps of: reacting stoichiometrically o-xylene with a mixture of nitrogen dioxide or nitrogen tetroxide and an oxygen-containing gas in the presence of a mercury salt, at a temperature of from about 25°C. to about 80°C. for from about 1.5 hours to about 8.0 hours, and recovering mononitro-o-xylene in good yield and having an isomer distribution ratio of at least 70:30 of 4-nitro-o-xylene to 3-nitro-o-xylene, respectively.

3,929,918
SYNTHESIS OF FLUOROGRAPHITE

Dayal T. Meshri; Wayne E. White, and Charles L. Sowell, all of Sand Springs, Okla., assignors to Ozark-Mahoning Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 295,675, Oct. 6, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,258
Int. Cl.² C07C *17/00*
U.S. Cl. 260—653.9 **22 Claims**

1. A process of preparing carbon fluorides comprising the steps of:

first treating relatively substantially pure carbon with substantially anhydrous hydrogen fluoride at a temperature in the range of 200°–350° C. for a period of 2 to 3 hours, then flushing the said hydrogen fluoride-treated carbon with an inert gas comprising one of the class of nitrogen, argon or helium in the temperature range of 300°–450° C. until the exiting gases are substantially free of HF,

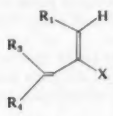
and thereafter reacting the substantially hydrogen fluoride-free carbon with fluorine at a temperature in the range of 300°–600° C. for a time period of 12 to 16 hours.

3,929,919
PROCESS FOR PRODUCING ALKYLIDENE ALKENE HALIDES

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Bernard J. Mayers, Cliffwood Beach, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

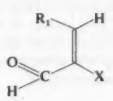
Filed July 30, 1973, Ser. No. 383,580
Int. Cl.² C02C *21/04*
U.S. Cl. 260—654 R **2 Claims**

1. A process for the preparation of an alkylidene trans alkene halide having the structure:

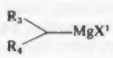


wherein R_1 is lower alkyl, R_3 is hydrogen and R_4 is lower alkyl; comprising the steps of:

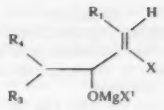
a. Reacting a halo-alkenal of the formula:



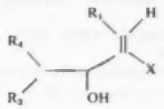
wherein R_1 is lower alkyl and X is chloro, bromo or iodo with a Grignard reagent of the formula:



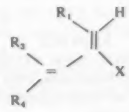
wherein R_3 is lower alkyl and R_4 is hydrogen and X^1 is bromo or chloro in order to provide an organometallic compound having the formula:



b. Hydrolyzing said organometallic compound with a hydrolyzing agent selected from the group consisting of dilute mineral acids and acid salts thereby forming a hydroxyalkene having the structure:



c. Reacting said hydroxyalkene with a dehydrating reagent which is an inorganic oxide, at a temperature of from 200°C up to 400°C, said inorganic oxide being selected from the group consisting of alimina and silica, thereby providing the corresponding alkylidene alkene halide having the structure:



3,929,920
PROCESS FOR CONTINUOUS FLUORINATION OF CARBON

Tetsuya Komo, Ikeda; Satoshi Mizobata, Takatsuki; Rokuo Ukaji, Ibaraki, and Tutomu Kamihigoshi, Takatsuki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed May 30, 1974, Ser. No. 474,805
Claims priority, application Japan, June 11, 1973, 48-66037; May 31, 1973, 48-64560[U]
Int. Cl.² C07C *17/00*
U.S. Cl. 260—653.9 **10 Claims**

1. A process for the continuous fluorination of carbon materials in a vertical reactor, said reactor having a top and bottom cover, feed and exhaust ports in the top cover and feed and exhaust ports in the bottom portion of the reactor and a plurality of horizontal trays vertically spaced along the internal surface of the reactor, which comprises the steps of:

a. introducing continuously a carbon material being selected from the group consisting of carbon black, coke, pitch coke, charcoal, artificial graphite and natural graphite,

b. distributing the carbon material onto each of the trays and forming a thin layer thereon,

c. introducing a fluorine gas or a mixture of fluorine gas and diluent continuously into the bottom part of the reactor,

d. reacting the carbon material on each of the trays with the gas at elevated temperature in the range from 250° to 600°C,

e. transferring the carbon material simultaneously from each of the trays to the tray below while continuing the reaction, and

f. removing the fluorinated carbon material continuously through an exhaust port in the bottom portion of the reactor.

3,929,921
RING COMPOUNDS

Gunther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 109,949, Jan. 26, 1971, Pat. No. 3,849,506, which is a continuation of Ser. Nos. 843,220, July 18, 1969, Pat. No. 3,586,727, and Ser. No. 845,901, July 29, 1969, Pat. No. 3,629,347, and Ser. No. 845,904, July 29, 1969, abandoned, each is a continuation-in-part of Ser. No. 582,775, Sept. 27, 1966, abandoned. This application Apr. 22, 1974, Ser. No. 463,087

Claims priority, application Germany, Sept. 29, 1965, 2443912

Int. Cl.² C07C *13/00*

U.S. Cl. 260—666 A **4 Claims**

1. A Large ring compound of the formula

A — θ — B

wherein

θ is cyclododecatriene - (1,5,9)

A is methyl or ethyl and

B is Hydrogen, methyl or ethyl.

3,929,922
NOVEL LARGE RING COMPOUNDS

Günther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 109,949, Jan. 26, 1971, Pat. No. 3,849,506, which is a continuation of Ser. No. 843,220, July 18, 1969, Pat. No. 3,586,727, and a continuation-in-part of Ser. Nos. 845,901, July 29, 1969, Pat. No. 3,629,347, and Ser. No. 845,904, July 29, 1969, abandoned, said Ser. No. 845,901, and Ser. No. 845,904, each is a continuation-in-part of Ser. No. 582,775, Sept. 27, 1966, abandoned. This application Apr. 22, 1974, Ser. No. 463,088

Claims priority, application Germany, Sept. 29, 1965, 2443912

Int. Cl.² C07C *13/00*

U.S. Cl. 260—666 PY **4 Claims**

1. A large bicyclic ring compound of the formula

A-θ-B

wherein θ is cyclodecatriene.1,4,7 wherein A and B form A-$(CH_2)_{10}$- bridge at the 1,2 position of the cyclodecatriene.

3,929,923
PROCESS FOR PREPARATION OF ISOMERS OF 1-CYCLOHEXYL-1,3,3-TRIMETHYLHYDRINDANE

Peter Hosler, Wallingford, and David S. Gates, Swarthmore, both of Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

Filed Jan. 17, 1972, Ser. No. 218,338

Int. Cl.² C07C *5/10*

U.S. Cl. 260—667 **12 Claims**

1. A process for the hydrogenation of 1-phenyl-1,3,3-trimethylindane comprising contacting said indane or a feed consisting essentially of said indane with hydrogen and with a hydrogenation catalyst containing nickel, palladium or rhodium, at a hydrogen pressure in the range of 600 to 1500 psig and a temperature in the range of 200° to 225°C, and recovering a product of said contacting which consists essentially of perhydrogenated 1-phenyl-1,3,3-trimethylindane and including a major proportion of 4,9-cis-1-cyclohexyl-1,3,3-trimethyl hydrindane.

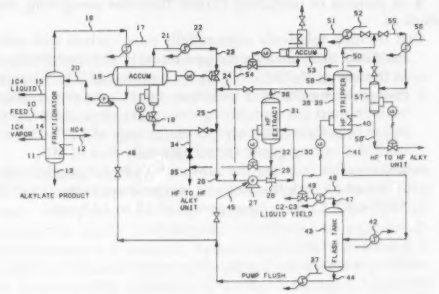
3,929,924
FRACTIONATION OF EFFLUENT FROM HF CATALYZED ALKYLATION

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 11, 1974, Ser. No. 478,226

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.42 **6 Claims**



1. In an alkylation operation of which an isoparaffin is alkylated with an olefin and wherein in the alkylation effluent there are present ethane, propane, butane, isobutane, organic fluorides and heavier hydrocarbons including alkylate boiling range hydrocarbons, and HF catalyst, and wherein the effluent is fractionated in a fractionation zone to remove therefrom a stream rich in ethane, propane, and HF, and organic fluorides, the steps in combination which comprise

a. partially condensing said stream to form a first liquid hydrocarbon phase rich in propane and relatively lean in ethane, a first vapor stream relatively rich in ethane and containing propane, HF and organic fluorides, and a first acid phase and using at least a portion of said first liquid hydrocarbon phase by pumping the same with a pump as reflux for said fractionation zone, thereby operating said fractionation zone at a pressure significantly lower than when the overhead therefrom is not treated to remove the ethane content thereof as herein described,

b. condensing said first vapor stream to form a second liquid phase containing propane, HF and organic fluorides and relatively rich in ethane,

c. settling said second liquid phase to form and to separate therefrom a second acid phase from a second liquid hydrocarbon phase,

d. passing said second liquid hydrocarbon phase to an HF stripping zone, in said stripping zone removing a stripped bottoms consisting substantially of only ethane and propane,

e. flashing said stripped bottoms to remove therefrom a second vapor stream containing ethane and propane, thus yielding a flashed bottoms stream lean in ethane, and lean in HF, and

f. using said flashed bottoms stream lean in ethane, and lean in HF, a flush for said pump in step (a), whereby the intermingling of the flush from the pump with said reflux will not significantly add ethane to said reflux and therefore to said fractionation zone.

3,929,925
RECOVERY OF A PROPANE-ETHANE PRODUCT AND RECYCLE OF PROPANE IN HF ALKYLATION

Charles Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

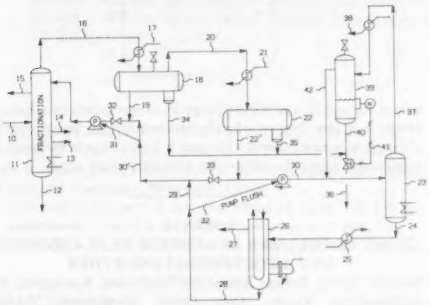
Filed June 7, 1974, Ser. No. 477,179

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.48 **3 Claims**

1. A process for the alkylation of an isoparaffin with an olefin in the presence of HF catalyst which comprises fraction-

ating in the fractionation zone an alkylation hydrocarbon phase to produce an overhead which contains ethane, propane, and HF, partially condensing said overhead producing (a) a first acid phase which is removed, from said process (b) a first liquid hydrocarbon phase containing propane lean in ethane and (c) a vapor stream containing HF, ethane and propane, passing said propane lean in ethane to the fractionation zone as reflux therefor, condensing said vapor stream to



form a second acid phase which is removed from said process and a second liquid hydrocarbon phase which is passed to an HF stripping zone to remove HF therefrom, separating from said stripping zone bottoms consisting essentially of ethane and propane, warming said bottoms, fractionating said bottoms into a propane-ethane product and a bottoms propane and passing said bottoms propane to one of said fractionation zone and said HF stripping zone.

3,929,926

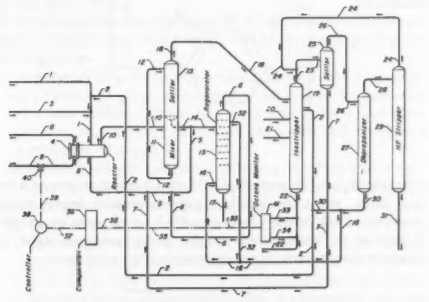
METHOD OF CONTROLLING HF ALKYLATION REACTION TEMPERATURE

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 468,956, May 10, 1974. This application Nov. 29, 1974, Ser. No. 528,389

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.48 **6 Claims**



1. A process for alkylating an isoparaffin with an olefinic feed stream containing at least two olefins, which process comprises the steps of:

a. reacting said isoparaffin with said feed stream in admixture with a hydrogen fluoride catalyst, in an alkylation reaction zone, at alkylating conditions resulting in a reaction product effluent containing normally liquid alkylate;

b. regulating the temperature of the reaction mixture, within said reaction zone, through indirect contact of said reaction mixture with a cooling medium passing through conduit means through said reaction zone, the flow of said cooling medium being adjusted by flow-varying means connected to said conduit means;

c. recovering said normally liquid alkylate from said product effluent;

d. introducing a sample of said alkylate into a hydrocarbon analyzer and developing therein an output signal which is representative of a composition characteristic of said sample; and,

e. transmitting said output signal to signal-receiving means and from said signal-receiving means to said flow-varying means, whereby the flow of cooling medium through said conduit means and the temperature within said reaction zone is adjusted in response to said composition characteristic.

3,929,927

RADIATION POLYMERIZABLE EPOXY COMPOSITION

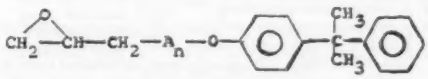
Nelson S. Marans, and Alfred Gluecksmann, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

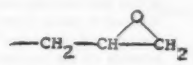
Filed Aug. 17, 1973, Ser. No. 389,316

Int. Cl.² C08F *2/46, 2/50;* **C08L** *63/02, 63/10*

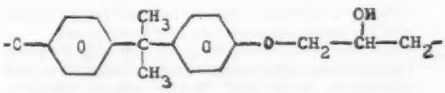
U.S. Cl. 260—837 R **2 Claims**

1. A radiation curable composition consisting of 40–95 parts of an epoxy compound having the formula

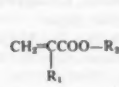




in which A is



and *n* has an average value of 0–13 and 5–60 parts of an ethylenically unsaturated compound having the formula



in which R_1 is hydrogen or a lower alkyl group, R_2 is an alkylene group having 2–8 carbon atoms, and R_3 and R_4 are lower alkyl groups.

3,929,928

BLEND OF THERMOPLASTIC POLYURETHANE ELASTOMER, CHLORINATED POLYETHYLENE, AND ADDITIONAL POLYETHYLENE

Harold G. Wolf, Jr., Waterbury, and Robert A. Hlavacek, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 345,923
Int. Cl.² C08L 75/00
U.S. Cl. 260—859 R 2 Claims

1. A method of making a shaped article comprising preparing a millable, calenderable thermoplastic composition comprising a blend of

a. a high molecular weight thermoplastic polyurethane elastomer devoid of ethylenic unsaturation and free —NCO groups which is a reaction product of a polymeric polyol, an organic polyisocyanate and a low molecular weight bifunctional material having two reactive hydrogens,

b. an elastomeric chlorinated polyethylene having a glass transition temperature of −30°C. to −20°C. and a chlorine content of 25–50% by weight, and

c. additional polyethylene resin, the weight ratio of (a) to (b) in the said blend being within the range from 75:25 to 40:60, and the amount of (c) being from 4.5 to 7.5 parts, per 100 parts by weight of (a) plus (b), and forming the resulting blend into a shaped article without cure.

3,929,929

VINYL URETHANE RESINS

Erich Kuehn, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed May 29, 1973, Ser. No. 364,911
Int. Cl.² C08L 75/00
U.S. Cl. 260—859 R 15 Claims

1. A composition comprising:

a. a vinyl urethane resin comprising the reaction product of a diol, a polyisocyanate having a functionality equal to from 2.1 to about 3.0, and a hydroxyl terminated ester of acrylic or methacrylic acid; provided that, (i) when the amount of the diol is equal to up to 1 mole, the amount of the polyisocyanate is equal to about 2 moles per mole of the diol and the amount of hydroxyl terminated ester is equal to about 2 moles per mole of the diol, (ii) when the amount of the diol is equal to greater than 1 mole, the amount of the polyisocyanate is equal to about 1 mole plus 1 mole per mole of the diol and the amount of the hydroxyl terminated ester is equal to about 2 moles, and (iii) at least 50 percent of the excess functionality of the polyisocyanate is reduced by reaction with the diol and, when less than 100 percent of the excess functionality of the polyisocyanate is reacted with the diol, an additional hydroxylcontaining compound is employed in an amount sufficient to introduce adequate hydroxyl groups to react with any remaining isocyanate functionality; and

b. a monomer selected from the group consisting of styrene, t-butyl styrene, alpha methyl styrene, chlorostyrene, divinyl benzene, acrylic acid, dimethyl maleate, dibutyl fumarate, butyl methacrylate, and nonyl methacrylate.

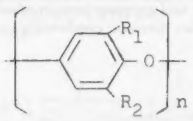
3,929,930

GRAFT COPOLYMERIZING A STYRENE TYPE COMPOUND AND A POLYPHENYLENE ETHER

Shinichi Izawa, Tokyo; Juro Ozeki; Tsutomu Tanaka, both of Yokohama, and Atsuo Nakanishi, Kanagawa, all of Japan, assignors to Asahi-Dow Limited, Japan

Filed Aug. 28, 1974, Ser. No. 501,450
Claims priority, application Japan, Sept. 6, 1973, 48-99712
Int. Cl.² C08L 23/00, 25/00
U.S. Cl. 260—874 18 Claims

1. A process for producing graft copolymers containing substantially no polyphenylene ether homopolymers comprising graft polymerizing with stirring under anhydrous conditions 20 to 200 parts of a styrene type compound of the group consisting of styrene, lower alkyl styrene and halostyrenes at a temperature of 130°C to 200°C in the presence of 100 parts by weight of a polyphenylene ether represented by the formula



where R_1 and R_2 are alkyl of 1 to 4 carbon atoms or a halogen atom, n is the degree of polymerization and has a number average between 50 and 300, and 0.1 to 15 parts by weight of a radical initiator based on the polyphenylene ether.

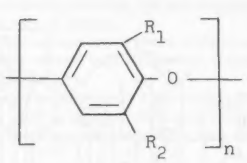
3,929,931

GRAFT COPOLYMER OF STYRENE TYPE COMPOUND AND A POLYPHENYLENE ETHER

Shinichi Izawa, Tokyo; Katsuhiko Tsuzimura, Kanagawa; Ken Mizushiro, Tokyo; Juro Ozeki, Kanagawa; Yoshiaki Sugawara, Kanagawa; Tsutomu Tanaka, Kanagawa, and Astuo Nakanishi, Kanagawa, all of Japan, assignors to Asahi-Dow Limited, Japan

Filed Aug. 28, 1974, Ser. No. 501,451
Claims priority, application Japan, Sept. 6, 1973, 48-99713
Int. Cl.² C08L 23/00, 25/00
U.S. Cl. 260—874 15 Claims

1. A graft copolymer composition which comprises 30 to 90 wt. % of a graft copolymer, 10 to 70 wt. % of a styrene type compound polymer having a number average molecular weight in the range from 50,000 to 200,000 and selected from the group consisting of styrene, lower alkyl styrenes and halostyrenes, said graft copolymer containing substantially no polyphenylene ether homopolymer and having been prepared by graft polymerizing with stirring under anhydrous conditions at a temperature of 130° to 200°C.20 to 200 parts by weight of a styrene type compound selected from the group consisting of styrene, lower-alkyl styrenes and halostyrenes on 100 parts of an oligophenylene ether having the formula



wherein R_1 and R_2 are alkyl of 1 to 4 carbon atoms or a halogen atom and n represents a polymerization degree ranging from 60 to 90, in the presence of 0.1 to 15 parts by weight of a radical initiator based on the polyphenylene ether, said composition having excellent resistance to creep.

3,929,932

HIGH IMPACT COMPOSITIONS OF POLYETHYLENE AND POLYPROPYLENE BLOCK COPOLYMERS

Eugene G. Castagna, Clark, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 26, 1973, Ser. No. 344,683
Int. Cl.² C08L 51/00, 53/00, 23/00
U.S. Cl. 260—876 B 9 Claims

1. A binary polypropylene composition having synergistic impact properties which comprises:

I. from about 3 to about 15 percent by weight of the total composition of a linear polyethylene component having

a melt index between about 0.5 and about 0.9 and a density of at least 0.93, and

II. from about 85 to about 97 percent by weight of the total composition of a block copolymer component containing

a. from about 60 to about 95 percent by weight of a polypropylene preblock, and

b. from about 5 to about 40 percent by weight of a postblock of a random copolymer of ethylene and another α-olefin, wherein the content of ethylene derived units in said postblock ranges between about 25 and about 75 mole percent.

3,929,933

RIGID PLASTIC ADMIXED WITH CROSSLINKED ACRYLATE/VINYL CHLORIDE INTERPOLYMER

Ruth E. Gallagher, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 182,127, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 101,160, Dec. 23, 1970, abandoned. This application Dec. 12, 1973, Ser. No. 424,128

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 R **14 Claims**

1. An impact resistant composition comprising an intimate admixture of a styrene-containing rigid plastic having a modulus of elasticity of greater than 7,000 kgf/cm² at 23°C. and 50% relative humidity and rubber-containing interpolymer particles consisting essentially of a crosslinked polymer of C_2–C_8 alkyl acrylate emulsion polymers having a glass transition temperature less than about 25°C. and a vinyl chloride suspension polymer surrounding and/or homogeneously dispersed within the mass of said crosslinked acrylate emulsion polymer.

3,929,934

NOVEL FLUOROELASTOMERS IN POWDER FORM

Albert Lloyd Moore, and Walter Kwei-Yuan Tang, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 19, 1973, Ser. No. 417,240

Int. Cl.² C08L *27/16, 27/18, 27/20*

U.S. Cl. 260—884 **13 Claims**

1. A process for the preparation of an elastomeric, fluorinated copolymer in powder form, said process comprising the following steps:

1. copolymerizing in an aqueous emulsion in the first stage of a two-stage polymerization process and in the presence of a free radical catalyst to at least about 90% monomer conversion a mixture of monomers which will result in a copolymer of about

a. 65–100 weight percent vinylidene fluoride and a second monomer selected from the group consisting of pentafluoropropene, hexafluoropropene, chlorotrifluoroethylene and a perfluorinated C_2–C_4 alkyl vinyl ether, the weight ratio of vinylidene fluoride to the second monomer being within the range of 0.67:1 to 3:1, and b. 0–35 weight percent tetrafluoroethylene, the resulting first-stage copolymer having a crystalline melting point of less than about 60°C.;

2. polymerizing in the second stage in the same emulsion at least one of the same monomers as in the first stage but in such proportions that the second stage polymer, if made separately, would have a crystalline melting point above about 120°C.;

3. flocculating the resulting dispersion; and

4. spray-drying the dispersion at a temperature of about 121°–177°C.;

the relative proportions of the components in the resulting polymer being 65–90 weight percent of the first-stage copolymer and 10–35 weight percent of the second-stage copolymer.

3,929,935

ELECTRON BEAM CURABLE COATING COMPOSITION

James F. Kinstle, Powell, Tenn., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 6, 1973, Ser. No. 384,522

Int. Cl.² C08L *33/08, 35/06;* **C09D** *3/81*

U.S. Cl. 260—885 **7 Claims**

1. A paint adapted to form a textured surface when polymerized in situ on a substrate by ionizing radiation which, exclusive of pigments and particulate mineral filler, consists essentially of a solution of a volatile, inert organic solvent and a mixture containing:

1. between about 90 and about 10 parts by weight of an alpha-beta olefinically unsaturated resin having an average molecular weight above 1000, containing between about 0.5 and about 5 units of alpha-beta olefinic unsaturation per 1000 units of molecular weight and being a copolymer of

a. about 50 to about 95 mole percent of styrene monomers selected from the group consisting of styrene, vinyl toluene, alpha-methyl styrene, t-butyl styrene and chlorostyrene and

b. about 5 to about 50 mole percent of acrylic monomers; and

2. between about 10 and about 90 parts by weight of vinyl monomers polymerizable with said unsaturated organic resin upon exposure to ionizing radiation, said unsaturated organic resin being soluble in said monomer only to the extent of between about 1 and about 15 weight percent based on the weight of said monomers.

3,929,936

POLYSTYRENE

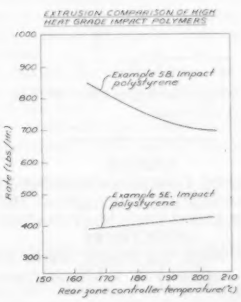
Thomas Ellis Davies, Barry, and Hubert Brian Hopkins, Swansea, both of Wales, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 89,938, Feb. 17, 1961, abandoned, said Ser. No. 651,660. This application Apr. 16, 1973, Ser. No. 351,712

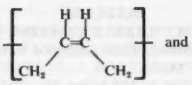
Claims priority, application United Kingdom, Feb. 27, 1960, 6955/60

Int. Cl.² C08L *9/06*

U.S. Cl. 260—892 **6 Claims**



1. A composition comprising a major proportion of a styrene polymer selected from the group consisting of homopolymers and copolymers of styrene and the nuclear methyl substituted styrenes having a softening point greater than 70°C and, as toughening agent, a minor proportion of a copolymer of butadiene and styrene, containing from 50 to 95 percent polymerized butadiene, from 30 to 95 percent of said polymerized butadiene units having the formula


and

in which the stereo configuration about the double bond is cis, said toughening agent having been obtained by polymerization with an alkyl lithium catalyst, said composition containing the toughening agent in discrete particulate form, dispersed in a matrix of the styrene polymer.

3,929,937

BIODEGRADABLE SHAPED ARTICLES FROM A MATERIAL COMPRISING A PARTICULATE ADDITION POLYMER IN A MATRIX OF A THERMOPLASTIC OXYALKANOYL POLYMER

Robert A. Clendinning, New Providence; James E. Potts, Millington, and William F. Gorham, Berkeley Heights, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 275,976. This application Sept. 6, 1974, Ser. No. 503,687

Int. Cl.² C08L *23/00, 25/04, 67/04*

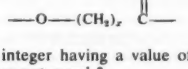
U.S. Cl. 260—896 **19 Claims**

1. Biodegradable shaped articles comprising a shaped composition of normally solid addition polymer dispersed in particulate form in a matrix of biodegradable thermoplastic oxyalkanoyl polymer, said addition polymer having been so dispersed in said oxyalkanoyl polymer at a temperature below the softening temperature of said addition polymer,

said composition comprising from about 20 to about 95 weight percent of said biodegradable thermoplastic oxyalkanoyl polymer and from about 80 to about 5 weight percent of said particulate, normally-solid addition polymer, based on the total weight of said composition,

said particulate, normally-solid addition polymer possessing a softening temperature at least about 15°C. higher than the melting point of said biodegradable thermoplastic oxyalkanoyl polymer, and

said biodegradable thermoplastic oxyalkanoyl polymer being characterized by a reduced viscosity value of at least about 0.1 and upwards to about 12 and being further characterized in that at least about 10 weight percent of said thermoplastic oxyalkanoyl polymer is attributable to recurring oxyalkanoyl units of the formula



wherein x is an integer having a value of 2 to 7, with the proviso that x does not equal 3.

3,929,938

LIMONENE/PHENOL CONDENSATION PRODUCTS AND HOT-MELT ADHESIVES CONTAINING THE SAME ALONG WITH ETHYLENE/UNSATURATED ESTER COPOLYMERS

Raymond Hadley White, and Fredric Martin Hill, both of Pensacola, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 174,190, Aug. 23, 1971, abandoned. This application Apr. 25, 1973, Ser. No. 354,454

Int. Cl.² C08L *23/08*

U.S. Cl. 260—897 B **5 Claims**

1. A hot-melt adhesive composition comprising:

a. a copolymer of ethylene and a 1,2-monoethylenically unsaturated ester selected from the group consisting of vinyl esters wherein the acid group contains from one to five carbon atoms and acrylic and methacrylic esters of saturated alcohols having from one to five carbon atoms, and mixtures of such copolymers, and

b. a limonene/phenol condensation product resulting from the acid catalyzed condensation between from 1.4 to 2.0 moles of limonene and 1 mole of phenol.

3,929,939

LARGE VOID-FREE POLYETHYLENE CASTINGS COMPRISING HIGH DENSITY POLYETHYLENE IN A LOW DENSITY POLYETHYLENE MATRIX

Ival O. Salyer, Dayton, and Charles J. North, West Carrollton, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 219,498. This application Dec. 13, 1973, Ser. No. 425,894

Int. Cl.² C08L *23/06*

U.S. Cl. 260—897 A **2 Claims**

1. A composite material which comprises 50 to 75 weight percent high density polyethylene pellets having a size range of about one-sixteenth inch to one-fourth inch in a matrix of 25 to 50 weight percent low density polyethylene.

3,929,940

HALOGEN-CONTAINING PHOSPHORIC ACID ESTERS

Horst Mayerhoefer, Oberwil, Basel-Land; Wolfgang Mueller, Neuallschwil, Basel-Land; Urs Sollberger, Fullinsdorf, Basel-Land, and Rainer Wolf, Allschwil, Basel-Land, all of Switzerland, assignors to Sandoz Ltd., (Sandoz AG), Basel, Switzerland

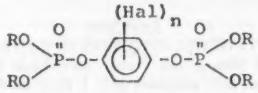
Filed Mar. 4, 1974, Ser. No. 447,921

Claims priority, application Switzerland, Mar. 9, 1973, 3513/73

Int. Cl.² C07F *9/09;* **C08K** *5/53*

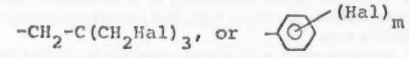
U.S. Cl. 260—930 **10 Claims**

1. A compound of the formula:



wherein

each R, is independently, a radical of formula



each Hal is independently, chlorine or bromine,

n is 0 or an integer 1, 2, 3 or 4

m is an integer 1, 2, 3, 4 or 5

and the molecule contains at least eight bromine atoms.

3,929,941

HUMIDIFIER

Frederick H. Horne, Rye, N.H., assignor to Rice Barton Corporation, Worcester, Mass.

Filed July 15, 1974, Ser. No. 488,272

Int. Cl.² B01F *3/04*

U.S. Cl. 261—35 **11 Claims**

1. A humidifying apparatus comprising

a housing having:

a flue gas inlet,

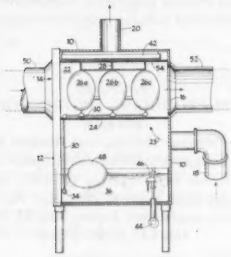
a flue gas outlet,

a circulating air inlet, and

a circulating air outlet spaced apart from said circulating air inlet to create a circulating air flow zone within said housing,

a flue gas conduit extending between said flue gas inlet and outlet,

an expansion chamber mounted in said conduit,
a water dispersing medium mounted in and open to said flow zone,
a water pipe connected to communicate between said chamber and said medium, and

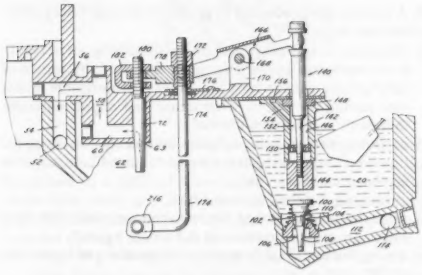


a water supply system connected to said expansion chamber,
whereby, when said flue gas inlet is connected to a source of hot flue gases, water is forced from said expansion chamber to said dispersing medium to humidify circulating air passing through said flow zone.

3,929,942
CARBURETOR COLD ENGINE AIR/FUEL MIXTURE ENRICHMENT APPARATUS

Robert S. Harrison, Grosse Ile; John D. Medrick, Plymouth, and Alvin P. Nowroski, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,824
Int. Cl.² F02M *1/10*
U.S. Cl. 261—39 B **8 Claims**



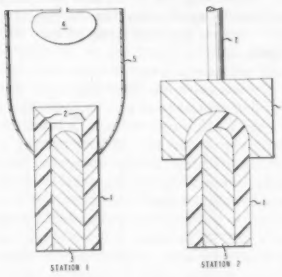
1. An air fuel mixture enrichment apparatus for cold weather starting and running operation of an internal combustion engine having a carburetor having an induction passage open to fresh air at one end and adapted to be connected at the opposite end to the engine intake manifold, a throttle plate mounted for rotation across the passage between closed and open positions to control the flow of air and fuel therethrough and spring biased to a closed position, a fuel supply port connected to the passage and responsive to movement of the throttle valve to different positions to induce different quantities of fuel into the passage,

the apparatus characterized by control means to both open the throttle plate to a wider open than normal position to increase the airflow and to increase the fuel supply to the passage, the control means including, first means rotatable with the throttle plate, temperature responsive means movable with changes in temperature from a predetermined level and fixed to a fast idle cam engaged by the first means, the fast idle cam having a stepped edge construction for the individual engagement of each step with the first means as a function of the movement of the cam by the temperature responsive means, the steps varying in extent or projection so as to permit variable closing of the throttle valve as a function of the step engaged, a fuel conduit connected to the induction passage at a location spaced from the fuel supply port to supply additional fuel to the passage, a needle valve movable into and out of the conduit to control fuel flow, connecting means operatively interconnecting the needle valve and fast idle cam to move the needle valve to increase the fuel supply with decreases in temperature, and other means operably interengaging the cam and first means during engine start-up operations to increase the throttle plate opening position beyond the schedule provided by the stepped edge engagement with the first means, the other means comprising a second surface on the cam of greater extent of projection into the path of movement of the first means than the steps.

3,929,943
PROCESS FOR SEALING THERMOPLASTIC TUBE

Charles Stanley Klimaszewski, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 299,095, Oct. 19, 1972, abandoned. This application Aug. 28, 1974, Ser. No. 501,458
Int. Cl.² B29D *23/01*
U.S. Cl. 264—25 **3 Claims**



1. A process for sealing an open end of a hollow, cylindrical, polyethylene terephthalate tube comprising:

a. providing a circumferential beveled edge on the open end of the tube,
b. locally heating the beveled open end of the tube to a surface temperature of about 260° to 315°C. in less than about 15 seconds,
c. pressing the beveled open end of the tube into a mold to force the beveled edges together and seal the open end, and
d. rapidly cooling the sealed tube.

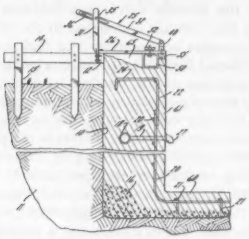
3,929,944
METHOD AND APPARATUS FOR FORMING SWIMMING POOL GUTTERS

Steve Oliver, 657 Chestnut, Deerfield, Ill. 60015

Filed Jan. 28, 1974, Ser. No. 437,066
Int. Cl.² E03C *1/00, 1/24*
U.S. Cl. 264—34 **9 Claims**

1. A method of constructing in an excavation in the ground a swimming pool wall with a gutter about its periphery comprising supporting an elongated flat form panel in a substantially horizontal position above the periphery of said excavation and parallel to the upper side of the intended pool wall securing an elongated gutter form to the underside of said panel in parallel relation to said panel, pressure spray directing concrete from within said excavation toward the side of

said excavation and the underside of said elongated form panel and gutter form thereby simultaneously forming a side wall of a pool with the upper side thereof at least partially



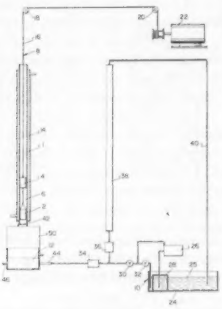
bounded by said form panel and at least patially forming a gutter in the upper portion of said side wall, and removing said panel and gutter form.

3,929,945

METHOD FOR MAKING TUBULAR POLYMERIC MEMBRANES FOR REVERSE OSMOSIS

William Thayer; Lucien Pageau, and Srinivasa Sourirajan, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 29, 1973, Ser. No. 365,031
Claims priority, application Canada, Aug. 23, 1972, 150045
Int. Cl.² B29D *27/04*
U.S. Cl. 264—41 **4 Claims**



1. A method of manufacturing a tubular polymeric membrane for reverse osmosis, comprising:

a. positioning a cylindrical casing on a casting bob,

b. pouring a casting solution into the cylindrical casing, the casting solution comprising a polymer, a solvent with the polymer dissolved therein, and a pore producing agent for the polymer,

c. attaching a leading bob to the casting bob to allow a clearance, when hauled, between the cylindrical casing and the casting bob,

d. removably securing the cylindrical casing to the leading bob, and

e. positioning at a lower end of a casting tube the casting bob with the cylindrical casing positioned thereon, containing the casting solution, and the leading bob attached thereto and removably secured to the cylindrical casing,

f. causing relative movement between the casting tube and the leading bob to initially cause the cylindrical casing to move away from the casting bob, whereby the casting solution is released from the cylindrical casing, and then a tubular polymeric membrane is cast, from the released casting solution, between the casting tube and the casting bob, while the positions of the leading bob and the casting bob are being changed to positions adjacent the upper end of the casting tube,

g. allowing solvent to evaporate from the cast tubular polymeric membrane,

h. circulating through the casting tube a gelation medium for the cast tubular polymeric membrane, and then

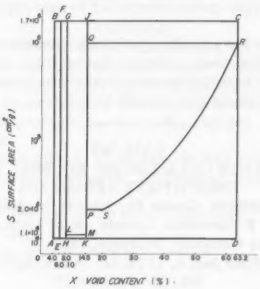
i. removing the cast tubular polymeric membrane from the casting tube.

3,929,946

PROCESS FOR PRODUCING HYGROSCOPIC ACRYLIC FIBERS

Zen-Ichi Orito; Minoru Uchida, and Noriaki Mori, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Division of Ser. No. 143,571, May 14, 1971, now abandoned. This application Sept. 5, 1973, Ser. No. 394,502
Claims priority, application Japan, May 15, 1970, 45-40910
Int. Cl.² B29C *25/00*
U.S. Cl. 264—41 **6 Claims**



1. A process for producing hygroscopic acrylic fibers which includes the steps of

a. preparing a spinning solution by dissolving an acrylonitrile copolymer containing more than 50% by weight of acrylonitrile with at least one other polymerizable monomer having the >C=C< structure and copolymerizable therewith in a solvent thereof,

b. extruding said spinning solution into an aqueous coagulation liquid containing said solvent to form fibers, containing open capillary voids,

c. stretching the thus formed fibers,

d. annealing the stretched fibers in the wet state with saturated steam at a pressure of 0.3 to 2.8 kg/cm²,

e. drying the annealed fibers at a temperature of lower than 110°C, and

f. treating the fibers with an aqueous solution containing a compound as a modifier selected from the group consisting of alkali metal hydroxide, alkali metal carbonate sulfuric acid, hydrochloric acid and hydroxylamine salt to render the surface of the fibers hydrophilic and accelerate condensation of moisture in the voids.

3,929,947

PROCESS FOR MANUFACTURING WALLBOARD AND THE LIKE

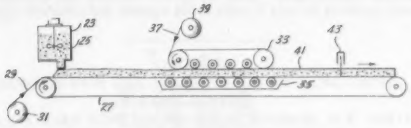
Murray Arthur Schwartz, Tuscaloosa, and Thomas Oscar Llewellyn, East Tuscaloosa, both of Ala., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 8, 1974, Ser. No. 495,486
Int. Cl.² B29H *7/20, 9/02;* **B22B** *31/06*
U.S. Cl. 264—42 **4 Claims**

1. A process for making porous wallboard panels and related porous building materials comprising the steps of:

a. providing a major quantity of molten sulfur at a temperature of about 130° to 155°C,

b. adding a minor amount of gypsum $CaSO_4.2H_2O$, to the molten sulfur in sufficient quantity such that the water in the gypsum vaporizes, thereby transforming the gypsum into



hemihydrate form, $CaSO_4.\frac{1}{2}H_2O$, thus causing foaming of substantially the entire quantity of molten sulfur,

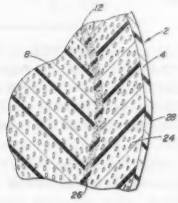
c. forming the foamed sulfur under pressure into the desired panel shape, and

d. cooling the formed panel.

3,929,948
METHOD FOR FABRICATING IMPACT ABSORBING SAFETY STRUCTURE

John A. Welch, Cuyahoga Falls, Ohio, and Robert W. Mitchell, Brown Deer, Wis., assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 195,260, is a continuation-in-part of Ser. No. 796,954, Feb. 6, 1969, abandoned. This application Oct. 19, 1973, Ser. No. 408,040
Int. Cl.² B29D 27/04
U.S. Cl. 264—45.5 **6 Claims**



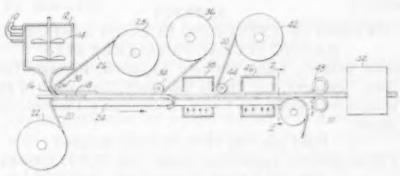
1. A method for fabricating an improved impact absorbing safety structure including a rigid deformable foam base member joined to a resilient foam outer layer member through a tough rigid composite crust member which is adapted to protect said base member from less than substantial impact forces received through said layer member, the steps comprising:

1. disposing a flexible resilient layer member of cured porous foam, having its integral skin as initially formed when foamed and cured removed from one exposed surface to expose a porous surface, into conforming relation with the molding surface of a mold as a preformed layer member with said porous surface disposed opposite said molding surface;
2. pouring a foaming mixture of thermosetting resin reactants selected to produce a rigid type foam onto said porous surface of said layer member while said mixture is in foaming condition;
3. Allowing a portion of said foaming mixture to permeate into said porous surface and partially into said layer member a distance sufficient to form a selected apparent thickness of a composite layer comprising said foaming mixture and said porous foam of said layer member; and
4. curing said foaming mixture to produce said rigid deformable base member and to convert said composite layer into said rigid composite crust member with said rigid composite crust member being tough yet frangible and adapted to break responsive to impact forces in excess of about 50 lbs., exemplified as a force exerted through said resilient layer member against said crust member by a solid hemispherical surface about 1 inch in diameter, and thereby allow such excess forces to be absorbed throug.. deformation of said base member.

3,929,949
PROCESS FOR FORMING MICROPOROUS SHEET

John T. Day, Pasadena, Md., and John G. Hollick, Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed June 21, 1974, Ser. No. 481,780
Int. Cl.² B29D 27/04
U.S. Cl. 264—46.4 **5 Claims**



1. In the process of forming a microporous sheet of solid polyurethane comprising the steps of casting an emulsion of fine droplets of a volatile organic liquid as the internal phase in a continuous phase comprising reactive material convertible through reaction to solidified, resilient polyurethane, said organic liquid being substantially non-solvent for and non-reactive with said reactive material, being immiscible in said continuous phase and being present in amount from about 60% to about 300% by weight based on the weight of the reactive material, said organic liquid containing catalytic or other non-volatile materials which are undesirable in the final sheet, reacting said material at a temperature below the boiling point of said liquid so that the liquid never boils to cause the emulsion to gel and solidify with said droplets held in the solidified material and removing said liquid without expanding the solidified material leaving pores and discontinuities in the solidified material to constitute passageways for air and vapor, the improvement which comprises forming a layer of the liquid emulsion, reacting the materials of the continuous phase of the emulsion to a resilient state capable of return to substantially its initial thickness when pressed to 50% of its initial thickness under conditions preserving the uniformity of the emulsion, subjecting the resilient material to physical pressure of short duration promptly after reaching said resilient condition and before completion of said reaction to express from said sheet a substantial portion of said non-solvent liquid together with materials dissolved or carried in said non-solvent liquid and to clear pores and passageways, completing said reaction to form a stable solid body and removing further organic liquid from the solidified material.

3,929,950
PROCESS FOR PRODUCING POROUS SYNTHETIC RESIN FILM AND SHEET

Tadashi Nakamura, and Hisami Hagiwara, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,353
Claims priority, application Japan, June 22, 1972, 47-61790
Int. Cl.² B01D 47/00; F02M 11/00
U.S. Cl. 264—49 **7 Claims**

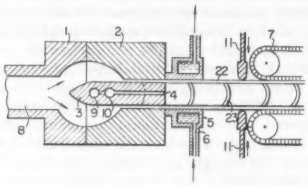
1. In a process for producing a porous synthetic thermoplastic resin film or sheet which exhibits a continuous porous structure which comprises eluting a melt molded article of a synthetic thermoplastic resin composition which consists essentially of a synthetic thermoplastic resin selected from the group consisting of a polyolefin and polyvinylidene fluoride containing 50% to 85% by weight of calcium sulfite powder as rod-shaped crystals having a maximum width of 1 to 10 μ and a minimum length of 5 to 100 μ to remove the calcium sulfite

from the stretched article by elution with a solvent for the calcium sulfite, the improvement comprising stretching said melt molded article uniaxially at a stretch ratio of 3 to 10 and at a temperature of from room temperature to 150°C prior to the elution of the calcium sulfite, said stretching being to an extent exceeding the elastic limit of the resin but not exceeding the maximum limit over which the melt molded article breaks to thereby form fine cracks between the resin and the calcium sulfite to increase the ease of elution, whereby said continuous porous structure is obtained, the specific gravity of the stretched film decreasing to less than 1, the specific gravity of said film prior to stretching being 1.39 to 1.90.

3,929,951
METHOD OF EXTRUDING HOLLOW STRUCTURE HAVING PLURAL PARALLEL CELLS

Osamu Shibata, Suita; Susumu Kojimoto, Ibaragi; Takami Sato, Toyonaka, and Yoshio Tadokoro, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 16, 1974, Ser. No. 489,061
Claims priority, application Japan, July 18, 1973, 48-81520
Int. Cl.² B29D *23/04;* **B29F** *3/00*
U.S. Cl. 264—89 **1 Claim**



1. A method for manufacturing a hollow structure of thermoplastic resin comprising the steps of

forming a resin path by a die body and a core member for the extrusion of the hollow structure comprising an outer shell having a plurality of spaces at an opening thereof and diaphragms,

extruding the thermoplastic resin from the die equipped with a gas path into said core member having at least two circuits communicating with said spaces,

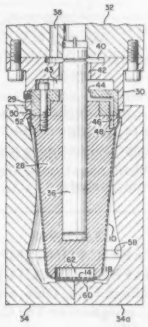
blowing gas alternately into the spaces within the extruded hollow structure through said circuits to expand and move the diaphragms and fuse alternate diaphragms with their adjoining diaphragms and outer sheets of said shell so that the hollow sections can be formed into isolated chambers for each of the alternate gas blows to prevent the outer shell of the hollow body from expanding substantially by contacting same with a cooling unit following said die body.

3,929,952
METHOD FOR MOLDING A PLASTIC CONTAINER

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 338,774, March 7, 1973, Pat. No. 3,867,086. This application July 15, 1974, Ser. No. 488,371
Int. Cl.² B29C *17/07*
U.S. Cl. 264—94 **2 Claims**

1. A method for making a plastic shaker-type container from a preform shaped to nest with others for shipment and storage and with each preform having an open end portion of predetermined peripheral configuration and an opposite smaller end portion of predetermined configuration with a plurality of shaker openings therethrough, including the steps of adhering a cover over said smaller end portion to seal said shaker openings, positioning said preform on a heated mandrel, shielding the preform end portions against the heat of the mandrel while heating the wall of said preform between the shielded end portions thereof to a reform shaping temperature associating the heated mandrel and preform mounted thereon with a female mold internally shaped according to the finished plastic shaker-type container, supporting said end portions of said preform in said female mold against deformation during

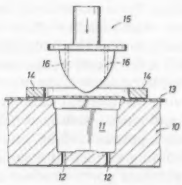


reform shaping of the preform, and shaping the wall of said preform between the shielded and supported end portions thereof under differential air pressure between the interior and the exterior of said preform against said female mold to the configuration of said plastic shaker-type container with maintained integrity of the predetermined configurations of said end portions.

3,929,953
METHOD FOR FORMING NONCIRCULAR THERMOPLASTIC CUPPED ARTICLES

Gerrit van der Gaag, and Thomas C. Tomey, both of Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 337,329, March 2, 1973, Pat. No. 3,859,028. This application Sept. 12, 1974, Ser. No. 505,438
Claims priority, application United Kingdom, Mar. 21, 1972, 13130/72
Int. Cl.² B29C *17/04*
U.S. Cl. 264—94 **3 Claims**



1. A method for molding hollow articles of a configuration having an approximately polygonal cross-section with rounded corners, from thermoplastic sheet comprising clamping a sheet of thermoplastic material over the opening of a molding cavity having said configuration, drawing the thermoplastic sheet into the cavity while the sheet is maintained in the solid phase at a temperature below its melting point by lowering a plug having a modified polygonal shape, the modification in cross-section consisting of an upper portion with rounded corners and concave indentation of the side walls and a lower portion converging from said indented upper portion to an unindented configuration approximately elleptical in planes parallel to the plane made by the undrawn sheet and approximately parabolic in planes perpendicular to the undrawn sheet, on to the sheet and into the molding cavity,

thereby causing the sheet to be forced into the cavity by first contacting the lower part of the plug in a sequence of progressively larger eliptical lines of contact, then the lower part of the plug and only the rounded corners of the upper part of the plug and thereafter providing a fluid pressure difference between said plug and fully plug stretched sheet forcing the sheet up against the walls of the mold cavity to form the hollow article.

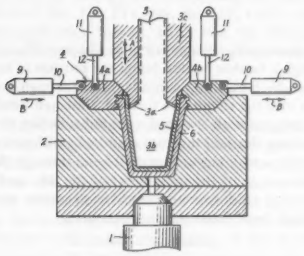
3,929,954
METHOD FOR THE PRODUCTION OF COMPOSITE CONTAINERS

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Division of Ser. No. 211,898, Dec. 27, 1971, Pat. No. 3,816,580. This application July 27, 1973, Ser. No. 383,264. The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

Int. Cl.² B29C *17/07*; B29F *1/10*

U.S. Cl. 264—97 **9 Claims**



1. In the method of making a composite plastic article using a previously formed plastic liner which is subject to deformation upon heating, while preventing substantial deformation of said previously formed liner, wherein a parison is formed on a blow core in a parison mold, said core having heated portions, and is expanded in a blow mold, the improvement comprising providing said previously formed liner generally conforming to the shape of at least part of said core, positioning said liner in alignment with the core, holding said heated portions and liner at least partly in spaced relationship until positioning the core for molding, bringing said liner and said core into molding position with said parison mold and applying said liner to said core as the core and said parison mold are being positioned for molding, thereby preventing substantial deformation of said liner.

3,929,955
PROCESS FOR PRODUCING AGGLOMERATES FROM FINE-GRAINED LIGNITE OR FINE GRAINED CARBONIZED LIGNITE OR FROM MIXTURES OF THE TWO

Werner Wenzel, Aachen; Peter Speich, Cologne; Roman Kurtz, Frechen; Heinrich Gudenau, and Friedrich Franke, both of Aachen, all of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne and Werner Wenzel, Aachen, both of, Germany

Filed May 15, 1973, Ser. No. 360,514

Claims priority, application Germany, June 8, 1972, 2227812

Int. Cl.² B01J *2/28*

U.S. Cl. 264—117 **7 Claims**

1. A process for producing pellets from fine-grained carbonized lignite having a grain size less than 0.5 mm. comprising mixing said carbonized lignite with a pellet-forming agent consisting of lignite filter ash and water, subjecting the mixture to a pelletizing action including a further addition of water to pelletize it and produce pellets of a larger size than said fine-grained carbonized lignite and drying said pellets to harden them.

3,929,956
PROCESS FOR WET WINDING FILAMENTS

Karl Severin Jakobsen, Somers, and Victor Joseph Nadeau, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 302,977, Nov. 1, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 503,002

Int. Cl.² B29B *1/04*

U.S. Cl. 264—137 **2 Claims**

1. A method of producing a substantially voidless filament reinforced resin matrix composite comprising:

mixing an amount of dry uncured powder of a high temperature, relatively low solvent solubility resin selected from the group consisting of polyimide, polybenzimadazole, polybenzothiozole and polyoxadiazole with a nearly saturated solvent solution of said resin to form a suspension of resin solids in said solution, said mixture being flowable and having a total resin content, relative to the solvent content, above 60 percent, by weight;

prior to said mixture becoming nonflowable, applying it to successive portions of high modulus, high strength filaments selected from the group consisting of boron, carbon, silicon carbide and silicon carbide coated boron to form a continuously matrixed laminate;

at least partially desolvating said applied mixture whereby voids are created; and

compression molding said desolvated laminate to eliminate said voids.

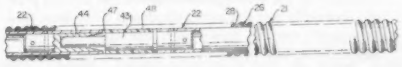
3,929,957
METHOD FOR PRODUCING A CONTINUOUS FLEXIBLE REINFORCED TUBULAR CONDUIT

Homer N. Holden, Sylva; James P. Hunt, Clyde; Vernon D. Browning, Waynesville; Edward L. Hogien, Candler, all of N.C., and Donald L. Kleykamp, Springboro, Ohio, assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 5, 1975, Ser. No. 555,493

Int. Cl.² B29B *21/52*, *21/56*; B29C *17/14*

U.S. Cl. 264—150 **4 Claims**



1. A method of producing a continuous flexible reinforced tubular conduit comprising the steps of, operatively associating a plurality of rigid mandrels is aligned end-to-end relation, moving said operatively associated mandrels in a continuous manner through a fabrication area using associated moving means, forming at least one elongated member into a continuous non-rotating helical coil about each mandrel as it moves through said area, said moving step comprising moving each mandrel with its helical coil thereabound through an extruder head of an extrusion apparatus at a speed correlated with the speed of forming said helical coil, extruding a tube of plastic material around said coil and mandrel as it moves through said extruder head to define said conduit, and separating said conduit from each of said mandrels.

3,929,958

PROCESS FOR PRODUCING RADIALLY-EXPANDED SOCKET ENDS ON THERMOPLASTIC PIPE LENGTHS

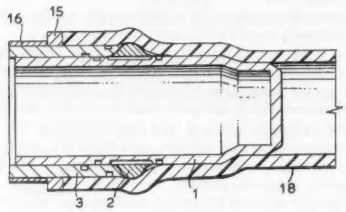
Gunnar Parmann, Mathopen, Norway, assignor to Rieber & Son Plastic-Industri A/S, Bergen, Norway

Continuation of Ser. No. 366,677, June 4, 1973, abandoned, which is a division of Ser. No. 246,217, April 21, 1972, Pat. No. 3,776,682. This application Jan. 23, 1975, Ser. No. 543,547

Claims priority, application Norway, Apr. 26, 1971, 1538/71; Sept. 27, 1971, 2386/71

Int. Cl.² B29D *3/02*

U.S. Cl. 264—249 9 Claims



1. A process for producing a radially expanded socket end with a radially expanded groove for an inner sealing element on a pipe length of thermoplastic material comprising the steps of

heating one end of a pipe length,

positioning a circumferentially split mould element of rigid elastic material having a wedge shaped side face portion on a substantially cylindrical face of a drift, said face having larger diameter than the outside diameter of the pipe length,

positioning a removable support member on said drift to axially support the mould element on said drift, said support member having an abutting surface cooperating with said wedge shaped side face portion to force said mould element into abutment with said drift surface during an influence of a pushing-on force exerted by the hot pipe end,

moving the heated end of the pipe length relatively over the mould element, the support member and the drift to radially expand the heated end and to locate the heated end in a final position axially on the drift,

subsequently removing the support member from adjacent the mould element and the heated end while said heated end remains axially undisplaceable in said final position, contracting the unsupported end of the heated pipe radially inwardly against said cylindrical drift face, and

subsequently cooling down such fashioned pipe end during support thereof in said final position by means of said mould element and said drift

---

3,929,959

METHOD FOR PRODUCING ORIENTED PLASTIC SHOTSHELLS

Donald Urquhart Findlay; Francis Hamnet Garland McGaffrey, and Derek Edgar Alexander Scuffell, all of Brownsburg, Canada, assignors to Canadian Industries Limited, Montreal, Canada

Filed Oct. 1, 1973, Ser. No. 402,593

Claims priority, application United Kingdom, Oct. 30, 1972, 49843/72

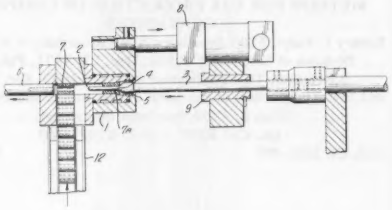
Int. Cl.² B29C *17/02*

U.S. Cl. 264—292 3 Claims

1. A method of producing an integral, oriented, crystalline polyolefinic shotgun cartridge comprising the steps of:

a. Heating an elongated, open-ended, thickwalled tubular blank of crystalline polyolefinic material to a temperature between about 80°F. and 240°F., but below the crystalline melting point of said polyolefinic material,

b. forcing said heated blank longitudinally for a distance equal to part of its length through an annular space defined by a fixed external die and a moveable internal mandrel in such a way that said blank is expanded circumferentially over said mandrel and reduced in wall thickness by extrusion through said annular space to form a biaxially oriented tubelike structure;



c. simultaneously compressing by the use of a ram acting through a further heated blank the portion of said tubular blank which has not been advanced through said annular space into the shape of a formed, shotshell head and base wad integral with the said oriented tubelike structure;

d. retracting the said internal mandrel and formed tubelike structure and integral shotshell head through the said die on the action of the movement of the die, and

e. removing said formed tubelike structure and integral shotshell head from the said mandrel.

3,929,960

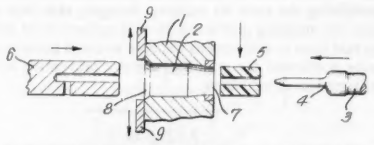
METHOD FOR PRODUCING ORIENTED PLASTIC SHOTSHELLS

Donald Urquhart Findlay; Francis Hamnet Garland McCaffrey, and Derek Edgar Alexander Scuffell, all of Brownsburg, Canada, assignors to Canadian Industries Limited, Montreal, Canada

Filed Oct. 1, 1973, Ser. No. 402,594

Int. Cl.² B29C *17/02*

U.S. Cl. 264—292 3 Claims



1. A method of producing an integral, oriented, crystalline polyolefinic shotgun cartridge having an enlarged head portion comprising the steps of:

a. heating an elongated, open-ended, thick-walled tubular blank of crystalline polyolefinic material to a temperature between about 80°F. and 240°F., but below the crystalline melting point of said polyolefinic material;

b. advancing said heated blank into a substantially cylindrical die cavity having an enlarged circumferential head end position by means of a reciprocating mandrel;

c. forcing said blank longitudinally for a distance equal to part of its length through an annular space defined by one outlet of said die cavity and said mandrel on the action of a reciprocating ram in such a way that said blank is expanded circumferentially over said mandrel and reduced in wall thickness by extrusion through said annular space to form a biaxially oriented tubelike structure and simultaneously compressing the portion of said tubular blank which has not been advanced through said annular space

into the shape of a formed, shotshell head and base wad integral with the said oriented tubelike structure and having an enlarged head portion;

d. retracting the said ram and further advancing the said mandrel and formed tubelike structure and integral shotshell head through the said die cavity; and

e. reversing the direction of movement of said mandrel to remove therefrom said formed tubelike structure and integral shotshell head having said enlarged head portion.

3,929,961
TREATMENT OF IRRADIATED NUCLEAR FUEL ELEMENTS

Robert Edmund Strong, Bootle, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 111,096, Jan. 29, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,837

Claims priority, application United Kingdom, Feb. 3, 1970, 5227/70

Int. Cl.² C01G *56/00*

U.S. Cl. 423—4 **3 Claims**

1. A method of treating an elongate irradiated nuclear fuel element comprising ceramic oxide nuclear fuel enclosed within a stainless steel metal sheath for removal of the fuel material from the sheath comprising disposing the elongate fuel element with a portion thereof within an induction coil, subjecting the induction coil to a radio frequency magnetic field to induce local induction heating of the metal sheath sufficient to raise the temperature of said metal sheath at the portion thereof within said coil to its melting temperature to effect local melting therein, and moving the fuel element axially relative to said induction coil while continuing heating to rupture said metal sheath.

3,929,962
TITANIUM PURIFICATION PROCESS

Chyn Duog Shiah, 189 Nassau Ave., Manhasset, L.I., N.Y. 11030

Filed Aug. 29, 1972, Ser. No. 284,541

Int. Cl.² C01G *23/02, 23/04, 23/06*

U.S. Cl. 423—82 **12 Claims**

1. The method of extracting purified TiO_2 from titanium-containing ores which comprises the steps of

a. reduction of said ores at elevated temperatures in the presence of a reducing gas, to convert at least 10 wt % of the tetravalent titanium contents of said ores to lower valent titanous compounds;

b. extracting said lower valent titanous compounds from the so-treated ores by solution as titanous chloride in an aqueous solution of hydrochloric acid;

c. separating the soluble titanous chloride extract from the residue;

d. returning the residue, containing undissolved titanium compounds, for retreatment according to step (a);

e. subjecting said separated aqueous extract, containing dissolved lower valent titanous chloride to an oxidation step to convert said titanous chloride, in solution, to titanium solutions;

f. hydrolyzing said titanium tetrachloride solution to hydrous titanium dioxide;

g. converting said hydrous titanium dioxide to titanium dioxide by calcination.

3,929,963
PROCESS FOR PREPARING CONCENTRATED TITANIUM MINERAL

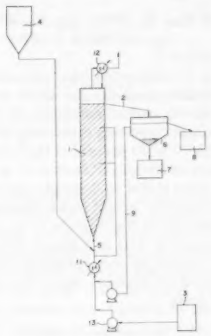
Tokuzo Kurata; Satoshi Emi; Kunihiko Ofuchi; Tsutomu Takeuchi, and Isamu Sone, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed June 11, 1974, Ser. No. 478,274

Claims priority, application Japan, June 11, 1973, 48-65723

Int. Cl.² C01G *23/04;* **C22B** *1/00*

U.S. Cl. 423—86 **6 Claims**



1. In a process for preparing a concentrated titanium mineral by reducing a titanium mineral with a reducing agent such that the iron components of the minerals are substantially reduced to the Fe^{+2} state, and thereafter leaching the reduced titanium mineral with an acid leaching agent which minimizes the formation of fine particulate material of a particle size diameter less than 10μ, the improvement which comprises:

leaching a reduced titanium mineral at a temperature from 80°C to the boiling point of the leaching agent by feeding said reduced titanium mineral having an average weight particle size of 50 – 300μ, and by feeding the acid leaching agent at a superficial linear velocity (volumetric flow rate/sectional area of tower) of $U1 \leq 0.004\ Dp + 0.15$ cm/sec, wherein U1 represents the superficial linear velocity of the acid leaching agent and Dp represents the average weight particle size (μ) of the titanium mineral into a tower leaching apparatus under fluidized conditions.

3,929,964
PROCESS FOR THE CONVERSION OF SODIUM SULFITE

Matthias Thoma, Johann-Strauss-Strasse 8, 8264 Waldkraiburg, Germany

Filed Sept. 23, 1974, Ser. No. 508,401

Claims priority, application Germany, Oct. 5, 1973, 2350191

Int. Cl.² C01D *1/20*

U.S. Cl. 423—183 **6 Claims**

1. A process for the conversion of sodium sulfite, obtained in the production of hydroxy aromatics, into sodium hydroxide and sulphur trioxide for recirculation in said production of hydroxy aromatics, which comprises:

a. reacting said sodium sulfite with zinc chloride to form sodium chloride and zinc sulfite,

b. heating said zinc sulfite to form zinc oxide and sulphur dioxide and oxidizing said sulfur dioxide to sulphur trioxide,

c. reacting said sodium chloride with ammonium bicarbonate to form ammonium chloride and sodium bicarbonate,

d. reacting said zinc oxide with said ammonium chloride to form zinc chloride and ammonia,

e. converting said ammonia to form ammonium bicarbonate, and

f. heating said sodium bicarbonate to form sodium carbonate and carbon dioxide, and reacting said sodium carbonate with calcium oxide to form sodium hydroxide.

3,929,965

DUAL PURPOSE AUTO EXHAUST CATALYSTS

Gwan Kim, Columbia, and Michael Vance Ernest, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 16, 1974, Ser. No. 470,596
Int. Cl.² B01D *53/00*
U.S. Cl. 423—213.5 2 Claims

1. A method of converting the noxious components of exhaust gases to innocuous entities which comprises contacting said gases, having carbon monoxide to oxygen ratios of 2 to 10 with a catalyst consisting essentially of a mixture of two catalysts in which 70 to 90 percent of the mixture is a reducing catalyst consisting essentially of from 0.01 to 5 weight percent palladium and from 0.004 to 2 weight percent rhodium and from 5 to 80 percent by weight nickel oxide; and in which 10 to 30 weight percent of the mixture is an oxidation catalyst consisting essentially of 0.01 to 5 weight percent platinum and from 0.01 to 5 weight percent palladium, wherein said catalysts are distended on alumina supports containing 1 to 30 weight percent ceria.

3,929,966

METHOD FOR REMOVING OXIDES OF NITROGEN FROM GASEOUS MIXTURES

Taijiro Okabe; Akitsugu Okuwaki, both of Sendai, and Shigetoshi Nakabayashi, Shinminato, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Japan

Filed Feb. 16, 1973, Ser. No. 332,792
Claims priority, application Japan, Feb. 19, 1972, 47-17556
Int. Cl.² B01J *8/00*; C01B *21/00*
U.S. Cl. 423—239 3 Claims

1. A method for removing oxides of nitrogen (NO_x) existing in gaseous mixtures which consists essentially of subjecting said gaseous mixtures to contact-reaction with an alkali metal manganate at a temperature of from 200°C to 600°C, thereby absorbing the oxides of nitrogen into said alkali metal manganate.

3,929,967

HIGH TEMPERATURE FLUE GAS TREATMENT

Everett Douglas Cann, Madison, Wis., assignor to Everett Douglas Cann and William T. Neiman, both of Madison, Wis.

Filed Jan. 3, 1972, Ser. No. 214,960
Int. Cl.² C01B *17/00*, *17/50*
U.S. Cl. 423—242 1 Claim

1. In a method of treating an effluent gas containing a minor but polluting amount of both sulfur dioxide and sulfur trioxide by contacting said effluent gas with ammonia to form an ammonium salt of a sulfur oxide, the improvement comprising:

introducing said ammonia in gaseous form while said effluent gas is at a temperature above about 220° F and below about 1200° F, and in an amount at least sufficient to react with all the sulfur trioxide but not more than that equivalent to about 2.0 mols of ammonia per mol of total sulfur oxides in said effluent gas to thereby convert substantially all of the sulfur trioxide to ammonium monosulfate and to convert sulfur dioxide predominantly to the bi-sulfite, under temperature conditions minimizing oxidation of sulfur dioxide to trioxide, wherein said ammonium salts include salts of both sulfur dioxide and sulfur trioxide,

recovering the resulting non-caking solid ammonium salts of sulfur oxides from said effluent gas at a temperature above about 220° F,

treating said salts with at least the stoichiometric amount of an aqueous member of the group consisting of alkaline earth metal oxide and zinc oxide to liberate ammonia for recycle and to form alkaline earth metal or zinc sulfur oxide salts,

and drying, dehydrating, and thermally decomposing said salts under reducing conditions to convert the sulfur from hexavalent to tetravalent sulfur oxide and thereby liberate a stream of sulfur dioxide and to recover alkaline earth metal oxide or zinc oxide for recycle.

3,929,968

DRY COLLECTION OF WASTE MATERIALS

Steven I. Taub, Claymont, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Oct. 10, 1973, Ser. No. 405,054
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 7 Claims

1. A process for treating hot gas streams to remove acidic or basic gaseous components comprising the steps

a. passing the hot gas through an evaporative cooler in admixture with a salt-containing scrubbing solution as defined hereinbelow, by which the hot gas is cooled above the dew point by evaporation of liquid from the scrubbing solution and solid particles of salt are formed in dispersion with the gas;

b. feeding the cooled gas having salt particles dispersed therein into a dry collector means by which the salt particles and any other dispersed solids are removed from the gas stream;

c. feeding the gas from which the solids have been removed into a scrubber wherein the acidic or basic components of the gas are absorbed into a scrubbing solution;

d. discharging the scrubbed gas from the scrubber and adjusting the pH of the scrubbing solution containing absorbed acidic or basic components by admixing therewith a salt-forming chemical by which a salt of the acidic or basic components is formed in dispersion within the scrubbing solution; and

e. feeding the salt-containing scrubbing solution to the evaporative cooler of step (a).

3,929,969

TRIVALENT METAL SALTS OF DODECAMETAL TRIACONTA CARBONYLS

Earle S. Brown, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,377
Int. Cl.² C01F *17/00*; C01G *1/04*
U.S. Cl. 423—263 15 Claims

1. Plural metal triaconta carbonyl salts of the formula:

$M_2[T_yT'_{12-y}(CO)_{30}]_3$

wherein M is a trivalent metal cation selected from the group consisting of aluminum, gallium, iridium, scandium, yttrium, and rhenium, T and T′ are each different metals selected from the group consisting of cobalt, iridium and rhodium, and y is any whole number between 1 and 11.

3,929,970

TL_3 PSE_4 COMPOUND, SINGLE CRYSTALS

Thelma J. Isaacs, Monroeville; Milton S. Gottlieb, Pittsburgh; John D. Feichtner, Murrysville, and Andrea A. Price, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,693
Int. Cl.² C01B *25/00*
U.S. Cl. 423—299 7 Claims

1. A compound having the general formula Tl_3XSe_4 where

X is about 50 to about 100% phosphorus and about 0 to about 50% arsenic.

3,929,971

POROUS BIOMATERIALS AND METHOD OF MAKING SAME

Della M. Roy, State College, Pa., assignor to Research Corporation, New York, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,644
Int. Cl.² C01B *15/16, 25/26;* A61F *5/04*
U.S. Cl. 423—308 45 Claims

1. Synthetic material useful as a biomaterial characterized by a substantially uniform pore volume in the range from about 10% to about 90% and having a microstructure characterized by a pronounced threedimensional fenestrate structure corresponding to the microstructure of the porous carbonate echinoderm or schleractinian coral skeletal material of marine life and providing a periodic minimal surface, said periodic minimal surface dividing the volume of said material into two interpenetrating regions, each of which is a single, multiply connected domain, said material having a substantially uniform pore size diameter and substantially uniform pore connections or openings in the range from about 5 microns to about 500 microns, said synthetic material being made up of a material selected from the group consisting of hydroxyapatite and whitlockite.

3,929,972

PRODUCTION OF SILICO-DIHYDROGEN SULFATE

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 287,898, Aug. 13, 1973. This application Nov. 27, 1974, Ser. No. 527,906
Int. Cl.² C01B *33/00*
U.S. Cl. 423—325 6 Claims

1. A method for producing silico-dihydrogen sulfate [$SiO(HSO_4)_2$] from sodium metasilicate pentahydrate, which comprises:

a. mixing slowly sodium metasilicate pentahydrate into concentrated sulfuric acid in the ratio of 1:4 mols with agitation over a period of 15–20 minutes, keeping the reaction temperature between 25°–100° C; the chemical reaction is completed in 2–6 hours,

b. producing a white granular mixture containing dihydroxy silicon dihydrogen sulfate [$(HO)_2Si(HSO_4)_2$], silico-dihydrogen sulfate [$SiO(HSO_4)_2$]; sodium hydrogen sulfate and water,

c. filtering off said sodium hydrogen sulfate and water,

d. adding an additional 2 mols of concentrated sulfuric acid per mol of sodium metasilicate to said white granular mixture for 20–30 minutes,

e. filtering off diluted sulfuric acid and sodium hydrogen sulfate, and thereby

f. producing additional silico-dihydrogen sulfate [$SiO(HSO_4)_2$] from said dihydroxy silicon dihydrogen sulfate.

3,929,973

PROCESS FOR THE PREPARATION OF CARBONYL DERIVATIVES

Daniela Belli Dell'Amico, Carrara, and Fausto Calderazzo, Ghezzano, both of Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

Filed Mar. 4, 1974, Ser. No. 447,739
Claims priority, application Italy, Feb. 5, 1973, 20007/73
Int. Cl.² C01G *1/04*
U.S. Cl. 423—417 2 Claims

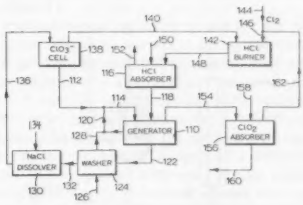
1. Process for the preparation of gold-carbonyl chloride and phosgene by reacting gold trichloride with carbon monoxide which consists in bubbling carbon monoxide through a solution of gold trichloride in thionyl chloride at room temperature and atmospheric pressure.

3,929,974

PRODUCTION OF CHLORINE DIOXIDE

John D. Winfield, Etobicoke, Canada, assignor to ERCO Industries Limited, Islington

Continuation of Ser. No. 166,733, July 28, 1971, abandoned, which is a division of Ser. No. 451,850, June 12, 1970, abandoned. This application Nov. 19, 1973, Ser. No. 416,879
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 4 Claims



1. A process for the production of chlorine dioxide which comprises continuously feeding an aqueous solution of an alkali metal chlorate and hydrochloric acid to a reaction zone to maintain an aqueous reaction medium in said reaction zone containing an alkali metal chlorate and hydrochloric acid and having an acidity of about 0.05 to about 1N, continuously forming chlorine dioxide and chlorine by reaction between said alkali metal chlorate and said hydrochloric acid in said reaction medium, continuously maintaining said reaction zone under a reduced pressure, continuously maintaining said reaction medium at its boiling point to evaporate water from said reaction medium to form continuously a gaseous phase in said reaction zone consisting of a mixture of chlorine dioxide, chlorine and water vapor, and to deposit alkali metal chloride in said reaction zone, continuously conducting said gaseous phase mixture out of said reaction zone, continuously recovering chlorine dioxide from said mixture, removing deposited alkali metal chloride from said reaction zone, forming an aqueous solution from said removed alkali metal chloride, continuously electrolyzing said latter aqueous solution to convert the alkali metal chloride at least partially to alkali metal chlorate and to generate hydrogen gas, continuously feeding at least the alkali metal chlorate content of the alkali metal chlorate-containing solution to said reaction zone, continuously reacting at least part of said hydrogen gas with chlorine gas to generate hydrogen chloride, continuously forming hydrochloric acid from said hydrogen chloride and continuously feeding at least part of said hydrochloric acid to said reaction zone.

3,929,975

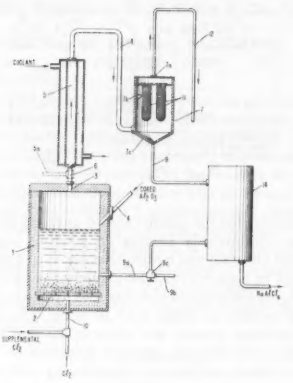
SELECTIVE RECYCLE PRODUCTION OF ALUMINUM CHLORIDE

Larry K. King, Maryville, Tenn., and Noel Jarrett, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 180,278, Sept. 14, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,534
Int. Cl.² C01F *7/58, 7/60*
U.S. Cl. 423—496 7 Claims

1. In a process for the production of aluminum chloride by exothermically reacting substantially hydrogen-free sodium contaminated alumina having less than 0.5% of iron, silicon and titanium impurities therein and no more than 1.0% of sodium impurities therein calculated as Na_2O and an average alpha alumina content of less than about 5% and an average surface area of at least about 10 m^2/g, with chlorine gas in the presence of a substantially hydrogen-free solid carbonaceous reducing agent to form a hot gaseous effluent containing aluminum chloride values, entrained particles including aluminum oxychloride values, and condensible volatile constitu-

ents including sodium aluminum chloride values, the steps of cooling the hot gaseous effluent to a predetermined low value intermediate the chlorination reaction temperature and the condensation temperature of aluminum chloride under the ambient conditions there extant to condense at least a portion of the sodium aluminum chloride values therein, separating a mixture of such condensed sodium aluminum chloride values, and entrained particles including aluminum oxychloride from



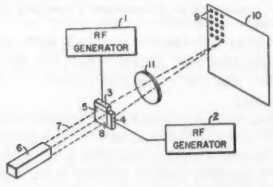
said gaseous effluent and selectively returning predetermined portions of said mixture to the chlorination zone during the continuance of the chlorination reaction therein in a combined amount of about 10–30% by weight of the alumina introduced into said chlorination zone to maintain catalytic enhancement of the chlorination reaction to progressively effect the removal of contaminant oxygen values from said hot gaseous effluent.

3,929,976

TL_3VS_4 AND TL_3NBS_4 CRYSTALS AND ACOUSTO-OPTICAL DEVICES

Thelma J. Isaacs, Monroeville; Milton S. Gottlieb, Pittsburgh; John D. Feichtner, Murrysville, and Andrea A. Price, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,695
Int. Cl.² C01G *15/00, 31/00, 33/00*
U.S. Cl. 423—511 **4 Claims**



1. A single crystal selected from the group consisting of Tl_3VS_4, Tl_3NbS_4, and non-conducting single crystal mixtures thereof which is at least about ½ cm in diameter and 1 cm long.

3,929,977

METHOD FOR THE THERMAL CONVERSION OF AMMONIUM SULFATE TO AMMONIUM BISULFATE

Earl D. Brennan, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 294,230, Oct. 2, 1972, abandoned. This application Aug. 14, 1974, Ser. No. 497,299
Int. Cl.² C01C *1/24*
U.S. Cl. 423—520 **7 Claims**

1. A method for converting ammonium sulfate to ammonium bisulfate comprising:

A. fusing a mixture of ammonium sulfate and ammonium bisulfate to form a molten salt mixture;

B. continuously introducing said mixture into a thin-film reactor to form a continuous thin flowing film of molten salt;

C. sweeping said thin flowing film of molten salt in said reactor with a hot inert gas selected from the group consisting of superheated steam, nitrogen, combustion gases and synthetic gases to convert said ammonium sulfate to ammonium bisulfate, and to sweep ammonia formed during said conversion from said reactor, said hot inert gas having a temperature after said sweeping not in excess of about 330°C.

3,929,978

PROCESS FOR PREPARING FERROMAGNETIC CHROMIUM DIOXIDE

Domenico Morero, Merano; Ugo Montiglio, Alessandria; Pierfrancesco Aspes, Alessandria, and Giampiero Basile, Alessandria, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Mar. 1, 1972, Ser. No. 231,028
Claims priority, application Italy, Mar. 4, 1971, 21316/71
Int. Cl.² C01G *37/02*
U.S. Cl. 423—607 **4 Claims**

1. A process for preparing high quality ferromagnetic chromium dioxide consisting of

heating a chromium (III) chromate salt of the formula $Cr_2(CrO_4)_3 \cdot nH_2O$ wherein n is from 1 to 8

at a temperature between 250° and 500°C

under an oxygen pressure between 30 and 1000 atmospheres.

3,929,979

PROCESS FOR GENERATING HYDROGEN

Carlos E. Bamberger; Donald M. Richardson, and Warren R. Grimes, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

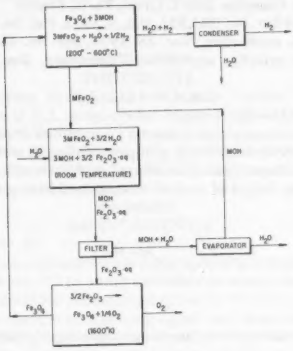
Filed Sept. 10, 1974, Ser. No. 504,790
Int. Cl.² C01B *1/03;* **C01G** *49/00;* **C01B** *5/00*
U.S. Cl. 423—648 **6 Claims**

1. A method for chemically generating hydrogen, comprising the steps of:

reacting magnetic iron oxide with a molten alkali metal hydroxide to produce hydrogen, alkali metal ferrite and water;

continuously exhausting the gaseous atmosphere from the reaction environment so as to continuously remove the

hydrogen and water produced during said step of reacting;



separating said hydrogen from said water; and collecting said separated hydrogen.

3,929,980

METHOD OF PRODUCING HYDROGEN

Bernard M. Abraham, Oak Park, and Felix Schreiner, Mokena, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 26, 1974, Ser. No. 536,694

Int. Cl.² C01B *1/02*

U.S. Cl. 423—648 **2 Claims**

1. A method for decomposing water chemically comprising reacting molten KNO_3 and vaporous I_2 to form NO, O_2 and crystalline KI, reacting the NO and one half of the O_2 thus formed with water to form HNO_3, forming NH_4I by reacting this HNO_3 with NH_3 to form NH_4NO_3 and reacting this NH_4NO_3 with the KI produced in the first step above recited, decomposing the NH_4I to obtain hydrogen, and recycling all compound produced in this series of reactions except hydrogen and onehalf of the oxygen produced in the first-recited step, the net effect of the total process thus comprising the decomposition of water.

3,929,981

METHOD FOR DETERMINING THYROID FUNCTION

Hari S. Murty, North Brunswick; Siva K. Gara, Old Bridge, and Dasika R. Murty, North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 27, 1974, Ser. No. 446,179

Int. Cl.² G01N *33/00*; **G01T** *1/16*

U.S. Cl. 424—1 **18 Claims**

1. In a method of determining thyroxine in serum by the competitive protein-binding technique comprising extracting thyroxine from the serum with a lower alkanol or dioxane solvent; adding to the serum and solvent a solution of thyroxine-binding globulin saturated with radioisotope labelled thyroxine; separating thyroxine that is bound to the thyroxine-binding globulin from unbound thyroxine; and counting the bound thyroxine, the unbound thyroxine, or both bound and unbound thyroxine; the improvement wherein: the solvent extract is not separated from the serum prior to the addition of the solution of thyroxine-binding globulin saturated with radioisotope labelled thyroxine.

3,929,982

METHOD AND COMPOSITION FOR THE DIAGNOSIS OF EQUINE INFECTOUS ANEMIA VIRUS INFECTION BY USING AGAR-GEL-IMMUNODIFFUSION REACTION

Leroy Coggins, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 196,060, Nov. 5, 1971, which is a continuation-in-part of Ser. No. 132,073, April 7, 1971, abandoned. This application Sept. 19, 1973, Ser. No. 398,744

Int. Cl.² A61K *39/12*, *39/42*; **G01N** *31/02*, *33/16*

U.S. Cl. 424—12 **18 Claims**

1. An immunological indicator system for use in the detection of equine infectious anemia in an equine comprising:

a liquid gel-forming material homogeneously mixed with a minor amount of a preparation consisting of an antigen which is specific in its reaction with equine infectious anemia virus precipitating antibody to form an insoluble complex which indicates the presence of equine infectious anemia virus, said antigen (A) obtained from an extract of the spleen removed from an equine acutely infected with equine infectious anemia virus, said equine having been inoculated with a virus of equine infectious anemia having sufficient virulence to render said equine severely febrile rapidly after inoculation with said virus, said spleen being removed from said equine after said equine becomes febrile but before the antigen in said spleen becomes substantially tied up or contaminated with antibodies to the antigen or (B) obtained as a concentrate from equine infectious anemia virus infected tissue culture; which antigen is not substantially tied up or contaminated with antibody to the antigen, the gel-forming mixture being in the form of a thin layer of said mixed materials having at least one well therein adapted to receive a test specimen of an animal suspected to be infected with said virus.

3,929,983

COMPOSITIONS AND METHODS OF KILLING RODENTS USING (DIPHENYL ACETYL)-2 INDANE DIONE-1,3

Eugene Boschetti, Venissieux, France, assignor to Lipha Lyonnaise Industrielle Pharmaceutique, Lyon, France

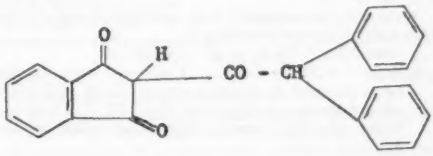
Continuation of Ser. No. 244,930, April 17, 1972, abandoned. This application June 11, 1974, Ser. No. 478,230

Claims priority, application France, Apr. 21, 1971, 71.14065

Int. Cl.² A01N *9/24*, *17/14*

U.S. Cl. 424—17 **8 Claims**

1. A composition having rodenticidal activity comprising an oily solution of (diphenyl acetyl)-2 indane dione-1,3 having the formula:



at a concentration between 0.1 and 2.5 g/liter, wherein said oil is liquid petrolatum.

3,929,984

INTRAUTERINE DEVICE AND METHOD FOR RELEASING PHARMACEUTICALLY ACCEPTABLE CONTRACEPTIVE HETEROGENOUS COMPOUNDS

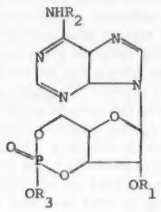
Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 201,054, Nov. 22, 1971, abandoned, and a continuation-in-part of Ser. No. 188,425, Oct. 12, 1971, abandoned, and a continuation of Ser. No. 886,358, Dec. 18, 1969, abandoned. This application Oct. 16, 1973, Ser. No. 406,831

Int. Cl.[2] A61K 9/22

U.S. Cl. 424—22 4 Claims

1. An intrauterine delivery device adapted for insertion and retention in a uterine cavity for the administration of pharmaceutically acceptable antifertility agent to the uterine cavity comprising a uterine acceptable matrix or hollow body of non-toxic, biologically inert, polymeric release rate controlling material containing therein a locally contraceptively active antifertility agent of the structural formula:



wherein R_1 is a member selected from the group consisting of hydrogen, lower alkyl of 1 to 7 carbon atoms and aliphatic acyl of 1 to 18 carbon atoms; R_2 is a member selected from the group consisting of hydrogen, lower alkyl of 1 to 7 carbon atoms, and aliphatic acyl of 1 to 18 carbon atoms; R_3 is a member selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms, and the pharmaceutically acceptable addition salts thereof, and wherein the device, while in the uterus, continually meters the flow of a contraceptively effective amount of agent up to 2000 micrograms per day, for a local antifertility effect through the uterine acceptable polymeric material at a controlled and predetermined rate over a prolonged period of time.

3,929,985

ANHYDROUS CANDICIDIN FOAM COMPOSITIONS

Norval Ellsworth Webb, Jr., Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed Jan. 18, 1974, Ser. No. 434,391

Int. Cl.[2] A61K 9/14

U.S. Cl. 424—45 3 Claims

1. An anhydrous, aerosol foam composition useful in the treatment of vaginitis consisting of:

a. from 0.2 to 0.5% by weight of Candicidin;

b. from 2 to 5% by weight of a nonionic, waxy, foaming agent prepared by reacting ethylene oxide with stearyl alcohol, having a melting range of 48°–52° C., a maximum iodine value of 3.5 and a maximum saponification value of 14;

c. from 0.5 to 2.0% by weight of polyoxyethylene (20) sorbitan monooleate;

d. from 0.05 to 1.0% by weight of propyl gallate;

e. from 5.0 to 20.0% by weight of an aerosol propellant selected from the group of chlorofluorohydrocarbons having a boiling point between −30° C. and 30° C; and

f. propylene glycol

3,929,986

ANTIPERSPIRANT COMPOSITION CONTAINING DIOXALUMININ AND DIOXALUMINANE

Claude Bouillon, Eaubonne; Pierre DuFaure, Paris, and Georges Rosenbaum, Asnieres, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

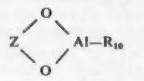
Division of Ser. No. 294,927, Oct. 4, 1972, Pat. No. 3,819,761. This application Mar. 25, 1974, Ser. No. 454,732

Claims priority, application Luxemburg, Dec. 16, 1971, 64463

Int. Cl.[2] A61K 7/38

U.S. Cl. 424—46 9 Claims

1. An antiperspirant cosmetic composition comprising in a solvent selected from the group consisting of water, a lower alkanol and an aqueous solution of said lower alkanol, 0.2–30 percent by weight of an active compound having the formula

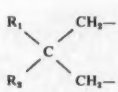


wherein

R_{10} is selected from the group consisting of chloro, —O-R″ wherein R″ is selected from the group consisting of methyl, ethyl, isopropyl and tertiary butyl and $—OSO_2R'$ wherein R′ is selected from the group consisting of alkyl having 1–4 carbon atoms, phenyl, p-chlorophenyl, hydroxyphenyl, tolyl and 2-oxo-10-bornanyl, and

Z represents a member selected from the group consisting of

(1)



wherein

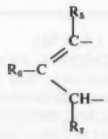
R_1 is selected from the group consisting of

a. $—COR_3$ wherein R_3 is selected from the group consisting of (i) methyl, (ii) ethyl, in which cases R_2 is methyl, and (iii) phenyl in which case R_2 is selected from the group consisting of methyl, acetyl and $—COOR_4$ wherein R_4 is alkyl containing 1–4 carbon atoms,

b. $—COOR_4$ wherein R_4 has the meaning given above in which case R_2 represents a member selected from the group consisting of methyl, $—C{\equiv}N$ and $—COOR_4$ wherein R_4 has the meaning given above,

c. $—NO_2$ in which case R_2 represents a member selected from the group consisting of bromine and alkyl containing 1–3 carbon atoms; and

(2)



wherein

R_7 represents a member selected from the group consisting of

d. methyl, in which case R_6 is $COOR_8$ and R_5 represents $—O-R_8$, wherein R_8 represents alkyl having 1–4 carbon atoms, and

e. hydrogen, in which case R_6 is selected from the group consisting of

iv. $—COR_9$ wherein R_9 is selected from the group consisting of methyl, in which case R_5 is selected from the group consisting of methyl and phenyl, and phenyl, in which case R_5 is methyl;

v. —COOR$_8$ in which case R$_8$ is selected from the group consisting of methyl, phenyl and —O-R$_8$ wherein R$_8$ has the meaning given above; and

vi. —C N in which case R$_8$ represents —O-R$_8$ wherein R$_8$ has the meaning given above.

3,929,987
TOOTHPASTE

Daniel Colodney, Bridgwater, and Martin Cordon, Highland Park, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 268,908, July 3, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,476The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.

Int. Cl.[2] **A61K** *7/18*

U.S. Cl. 424—52 **6 Claims**

1. A macroscopically visible particle having a mean particle size from about 177 to about 840 microns comprising a functional ingredient for promoting hygiene in the oral cavity and an effective amount of a binding agent, said functional ingredient comprising from 1 to 99 percent by weight of said particles and being in the form of subparticles having a size from about 1 to about 20 microns, said functional ingredient being chosen from the group of anticaries agents consisting of water soluble anticaries fluoride salts and anticaries antimicrobial materials, said binding agent being chosen from the group of polyethylenes having a molecular weight from about 1,000 to about 5,000 and a hardness measured as tenths of a millimeter needle penetration (ASTM D 1321) of about 1 to about 15.

3,929,988
FLAVORED DENTIFRICE

Jordan B. Barth, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed June 21, 1974, Ser. No. 481,655

Int. Cl.[2] **A61K** *7/16, 9/50*

U.S. Cl. 424—54 **20 Claims**

1. A dentifrice having a liquid vehicle and which includes as a minor proportion thereof an encapsulated sweetener composition comprising about 0.1 to 10% of a dipeptide sweetener in admixture with a non-toxic acid-containing component and encapsulated or covered with a shell or coating through which said admixture does not penetrate substantially during storage of the dentifrice and which is substantially unpenetrable by the components of said dentifrice but which shell or coating is broken during use of the dentifrice, causing the same to be released, said acid-containing component included in amounts sufficient to maintain the pH in said capsule at substantially about 3–5 and thereby impart an acid pH to said sweetener upon fracture of said capsule.

3,929,989
STABLE SUSPENSION OF CALCIUM-MAGNESIUM OXYTETRACYCLINE FOR INTRAUTERINE ADMINISTRATION IN TREATMENT OF BOVINE METRITIS

Gregory P. Bergt, Belle Plaine, Minn., assignor to Wendt Laboratories, Inc., Belle Plaine, Minn.

Filed June 14, 1974, Ser. No. 479,430

Int. Cl.[2] **A61K** *31/65*

U.S. Cl. 424—227 **3 Claims**

1. A therapeutic composition for intrauterine infusion in bovine species for treating metritis, which comprises:

a stable suspension of calcium-magnesium oxytetracycline and having a molar ratio of combined calcium and magnesium to oxytetracycline of about 4–4.3 to 1,

in an aqueous solvent of 1,2 propanediol containing about 17 percent water, at a pH substantially between 5.0 and 11.

3,929,990
MICROBIOCIDAL POLYMERIC QUATERNARY AMMONIUM COMPOUNDS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application Aug. 7, 1974, Ser. No. 495,328The portion of the term of this patent subsequent to Jan. 1, 1992, has been disclaimed.

Int. Cl.[2] **A01N** *9/20, 9/24;* **A61K** *15/00, 17/00*

U.S. Cl. 424—78 **4 Claims**

1. A method of controlling the proliferation of bacteria and algae in a water-in-oil emulsion which comprises incorporating intó said emulsion a condensation product as an antimicrobial agent and an amine oxide as an emulsifier, said condensation product being formed by mixing 1,4-dihalo-2-butene and 1,4-bis-dimethylamino-2-butene dissolved in a solvent at room temperature whereby an exothermic reaction is obtained causing the temperature of the mixture to rise, then maintaining the mixture at no higher than reflux temperature until the reaction is complete, the reactants being present in the reaction in relative molar proportions to each other of between about 1:3 and about 3:1, said condensation product being present in the emulsion in a bactericidally and algicidally effective amount, and said amine oxide being present in an amount effective to emulsify the composition.

3,929,991
POLYCATIONIC INTERFERON INDUCES

David L. Steward, Carmel, Ind., and Wen-Hong Tong, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 26, 1973, Ser. No. 382,975

Int. Cl.[2] **A61K** *39/00, 45/04, 31/785*

U.S. Cl. 424—78 **4 Claims**

1. A method which comprises parenterally administering to an animal about 18 to about 24 hours prior to viral infection an aqueous parenteral vehicle having a substantially neutral pH and containing an antiviral effective amount of polycation as a condensation polymer of pentachloropyridine with polyethylenimine having a molecular weight of from about 600 to about 60,000, wherein the gram atomic ratio of polyethylenimine nitrogen to pentachloropyridine nitrogen is from about 2:1 to about 8:1, wherein the condensation polymer is the product resulting from mixing together in the presence of an inert organic liquid reaction medium the said proportions of polyethylenimine and pentachloropyridine and wherein the polyethylenimine has a molecular weight of about 600 to about 60,000.

3,929,992
RAPAMYCIN AND PROCESS OF PREPARATION

Surendra N. Sehgal, Dollard des Ormeaux; Teodora M. Blazekovic, Mount Royal, and Claude Vezina, Deux-Montagnes, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 293,699, Sept. 29, 1972, abandoned. This application Apr. 12, 1974, Ser. No. 460,665

Int. Cl.[2] **A61K** *35/00*

U.S. Cl. 424—122 **4 Claims**

1. Rapamycin, an antibiotic which

a. is a colourless, crystalline compound with a melting point of 183° to 185°C, after recrystallization from ether;

b. is soluble in ether, chloroform, acetone, methanol and dimethylformamide, very sparingly soluble in hexane and petroleum ether and substantially insoluble in water;

c. shows a uniform spot on thin layer plates of silica gel;

d. has a characteristic elemental analysis of about C, 66.84%, H, 8.84%; N, 1.37%,

e. exhibits the following characteristic absorption maxima in its ultraviolet absorption spectrum (95% ethanol): 267

nm ($E_{1cm}^{1\%}$ 417), 277 nm ($E_{1cm}^{1\%}$ 541) and 288 nm ($E_{1cm}^{1\%}$ 416);

f. has a characteristic infrared absorption spectrum shown in accompanying FIG. **1**;

g. has a characteristic nuclear magnetic resonance spectrum as shown in accompanying FIG. **2**;

h. has a minimum inhibitory concentration of 0.02 to 0.1 μg/ml against *Candida albicans*; and

i. exhibits a LD_{50} (i.p., mice) of 597.3 ± 28.1 mg/kg and a LD_{50} (p.o., mice) of >2,500 mg/kg.

3,929,993

PROCESS FOR REMOVING COPPER FROM COPPER-CONTAINING BLEOMYCIN GROUP ANTIBIOTICS

Tomohisa Takita, Asaka; Akio Fujii, Tokyo; Yasuhiko Muraoka, Tokyo; Shigeru Mizuguchi, Tokyo, and Hamao Umezawa, Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1973, Ser. No. 330,686

Claims priority, application Japan, Feb. 17, 1972, 47-16021

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **16 Claims**

1. A process for removing copper from copper-containing bleomycin antibiotics, comprising adsorbing a copper-containing bleomycin antibiotic onto a non-ion-exchangeable macroreticular resin by contacting said resin with an aqueous solution containing said antibiotic, then contacting the resin with an aqueous solution containing 3–10% of a chelating agent, said solution having a pH in the range 4–9, to release copper from the antibiotic, and thereafter contacting the resin with a solution selected from the group consisting of alcohol and acetone containing 20–50% by volume of water and 0.01–0.001 N of acid to elute the antibiotic.

3,929,994

ANTI-INFLAMMATORY GLYCOPROTEIN COMPOSITIONS AND METHOD OF USE

Jean Hirsch, Paris, and Jean Pierre Buret, Osny, both of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 330,403, Feb. 7, 1973, Pat. No. 3,855,197, which is a continuation-in-part of Ser. No. 38,482, May 18, 1970, abandoned. This application Sept. 23, 1974, Ser. No. 508,335

Claims priority, application France, May 20, 1969, 69.16297; Feb. 15, 1972, 72.05016

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **6 Claims**

1. An anti-inflammatory composition comprising an effective amount of glycoproteins extracted from at least one type of microbial bodies selected from the group consisting of Pneumococci, Streptococci, Neisseria, Micrococci, Staphylococci, Klebsellia Pneumoniae and hemophilus influenzae and from a mixture of at least 2 of the said strains or an association of different types of the same microbial species, said glycoproteins having a molecular weight of at least 1,000,000, being thermo stable and soluble in perchloric acid, phytic acid, ammonium sulfate and trichloroacetic acid, having a content of at least 50% of combined hexoses, a biuretogenic substance content of about 10%, a ratio of combined hexoses to protides of about 7, a molecular volume (Ve/VO) as determined through Sephadex G 200 gel of 1.0 to 1.2 in relation to a buffer with a pH of 8, an α-amine nitrogen content of 1 to 2% and a migration by electrophoretic density gradient comprised between α-proteins and β-proteins and acid hydrolysis under reduced pressure shows the presence of glucose, glactose and mannose but not ribose and a pharmaceutical carrier.

3,929,995

METHOD FOR TREATING DIABETIC KETOACIDOSIS

Yuzo Kawashima, No. 2-35, Aza Nishinokoshi, Yagura, Ohtsucho, Naruto, Tokushima, Japan

Filed Sept. 26, 1974, Ser. No. 509,604

Claims priority, application Japan, Sept. 26, 1973, 48-107613

Int. Cl.² A61K *27/00*

U.S. Cl. 424—178 **6 Claims**

1. A method for treating diabetic ketoacidosis which comprises orally or parenterally administering to a subject afflicted with diabetic ketoacidosis to reduce keto bodies in plasma a therapeutically effective amount of (+)-octanoylcarnitine.

3,929,996

PHARMACEUTICAL COMPOSITIONS CONTAINING A DIGOXIN COMPLEX

Takeru Higuchi, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

Division of Ser. No. 375,052, June 29, 1973, Pat. No. 3,839,317. This application July 29, 1974, Ser. No. 492,827

Int. Cl.² A61K *31/705*

U.S. Cl. 424—182 **17 Claims**

1. A pharmaceutical composition for treating cardiac insufficiency consisting essentially of a pharmaceutical acceptable inert adjuvant and a digoxin complex of the formula:

D . An

wherein D represents digoxin, A represents a member selected from the group consisting of resorcinol, hydroquinone and pyrocatechol, and wherein n represents 1, 1-½ or 2,

said digoxin complex being present in a cardiotonic effective amount.

13. A method for treating cardiac insufficiency in warm-blooded animals which comprises:

orally administering thereto, a cardiotonic effective amount of the complex of claim **1.**

3,929,997

BATH COMPOSITION FOR HUMAN BODY

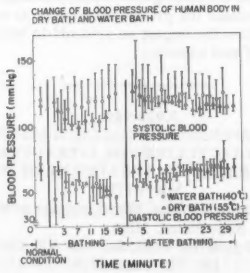
Hirofumi Matsui, No. 6-16, Higashi 2-chome, Shibuya-ku, Tokyo, Japan

Continuation of Ser. No. 213,428, Dec. 29, 1971, abandoned. This application Feb. 1, 1974, Ser. No. 438,670

Claims priority, application Japan, Dec. 31, 1970, 45-125709

Int. Cl.² A61K *27/00*

U.S. Cl. 424—195 **4 Claims**



1. A powdery bath composition for human body comprising a mixture of 90 to 10% by weight of powdery coffee grounds left after extraction of coffee essence and 10 to 90% by weight of at least one powder of a vegetable material selected from the group consisting of defatted soybeans, defatted cotton seeds, defatted rice bran, baggasse, corn core and pineapple stalk, wherein the water content is adjusted to 30–50% by

weight of the total composition and the pH value is adjusted to about 5 and the temperature is 55° to about 60°C.

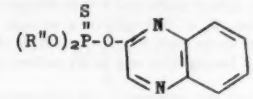
3,929,998

NOVEL METHOD OF PROTECTING COTTON PLANTS FROM INSECT ATTACK

James Byron Lovell, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 24, 1967, Ser. No. 640,795
Int. Cl.² A01N 9/36
U.S. Cl. 424—200 8 Claims

1. A method for protecting cotton plants from insect attack by applying to said cotton plants an insecticidally effective amount of a compound of the structure:



wherein R'' is methyl or ethyl.

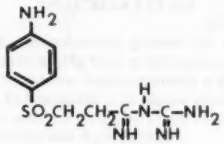
3,929,999

ORAL HYPOGLYCEMIC METHOD

Clifford John Heaphy, 1635 Harvard N.E., Albuquerque, N. Mex. 87106

Division of Ser. No. 314,545, Dec. 12, 1972, Pat. No. 3,852,353. This application Sept. 26, 1974, Ser. No. 509,448
Int. Cl.² A61K 31/63
U.S. Cl. 424—228 1 Claim

1. The method of treating diabetes mellitus which comprises orally administering to a diabetic human an anti-diabetic effective amount of a composition containing as an essential active ingredient:



3,930,000

SILVER-ZINC ALLANTOINATE COMPOSITIONS AND METHOD OF KILLING BACTERIA AND FUNGI THEREWITH

Harry W. Margraf, Clayton, Mo., assignor to Washington University, St. Louis, Mo.

Division of Ser. No. 153,820, June 16, 1971, Pat. No. 3,856,805. This application May 9, 1974, Ser. No. 468,228
Int. Cl.² A01N 9/00; A61K 31/28, 31/555
U.S. Cl. 424—245 8 Claims

1. A method of killing bacteria and fungi in an infected area comprising topically applying to the infected area an effected amount of silver-zinc-allantoinate of the formula $(C_4H_5O_3N_4Ag)_2:Zn(OH)_2$.

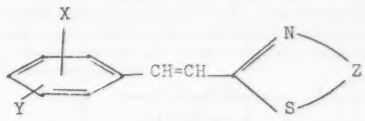
3,930,001

2-(SUBSTITUTED)-5,6-DIHYDRO-4H-1,4-THIAZINES USED FOR THE CONTROL OF RICE BLAST

Richard C. Koch, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 203,455, Nov. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 41,532, May 28, 1970, Pat. No. 3,624,217, which is a continuation-in-part of Ser. No. 788,642, Jan. 2, 1969, abandoned. This application Sept. 17, 1973, Ser. No. 397,758. The portion of the term of this patent subsequent to Nov. 30, 1988, has been disclaimed.
Int. Cl.² A01N 9/12
U.S. Cl. 424—246 5 Claims

1. A process for the control of fungal disease on rice plants which comprises contacting the plants with a fungicidally effective amount, in admixture with a carrier therefor, of a compound having the formula



or a non-phytotoxic acid addition salt thereof wherein X and Y are each chloro or fluoro; and Z is trimethylene.

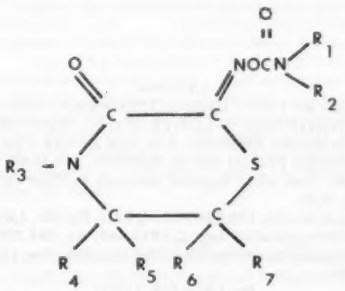
3,930,002

CARBAMATE PESTICIDAL COMPOSITIONS

John Apling Durden, Jr., 1228 Ridge Drive, South Charleston, W. Va. 25309

Continuation-in-part of Ser. No. 319,532, Dec. 29, 1972. This application June 7, 1974, Ser. No. 477,417
Int. Cl.² A01N 9/00, 9/12
U.S. Cl. 424—246 22 Claims

1. An insecticidal and miticidal composition comprising an acceptable carrier and a miticidally or insecticidally effective amount of a compound of the structural formula:



wherein:

R_1 is lower trihaloalkanesulfenyl or lower alkanoyl;
R_2 is hydrogen or lower alkyl;
R_3 is hydrogen, lower alkyl, or lower alkenyl;
R_4, R_5, R_6 and R_7 are individually hydrogen or lower alkyl.

3,930,003
COUMARINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Karl Heinz Becker, Rossdorf near Darmstadt; Karl-Heinz Boltze, Bensberg-Kippekausen; Hans-Dieter Dell, Cologne, and Peter-Rudolf Seidel, Porz-Wahnheide, all of Germany, assignors to Troponwerke Dinklage & Co., Cologne, Germany

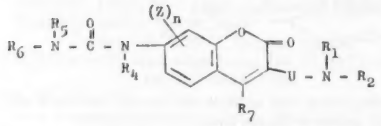
Division of Ser. No. 163,110, July 15, 1971. This application Mar. 13, 1974, Ser. No. 450,925

Claims priority, application Germany, July 17, 1970, 2035536; Feb. 20, 1971, 2108185

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 **21 Claims**

1. A coronary dilator composition comprising, as an active ingredient, an effective amount of a compound of the formula



(I)

wherein R_1, R_2, R_3, and $R_4$are hydrogen, or straight-chain or branched-chain alkyl or hydroxyalkyl of up to 4 carbon atoms, cyclohexyl, phenyl or phenyl substituted with one of halogen, hydroxy, lower alkyl or alkoxy of 1 to 3 carbon atoms, or trifluoromethyl; at least one of the radical pairs R_1 and R_2, and R_5 and R_6, when taken together with the adjacent nitrogen atom represent morpholino or methylmorpholino; R_4 is hydrogen, lower alkyl of up to 3 carbon atoms, R_7 is hydrogen, lower alkyl of up to 3 carbon atoms, or phenyl; Z is halogen or lower alkyl of up to 3 carbon atoms; *n* represents a number from 0 to 2, and U is straight-chain or branched-chain lower alkylene, or monohydroxy-alkylene of from 2 to 5 carbon atoms; and the pharmacologically acceptable salts thereof in admixture with a pharmaceutically acceptable carrier.

3,930,004
METHOD OF USING PHENOXYPROPANOLPIPERAZINE COMPOUNDS TO LOWER BLOOD PRESSURE

John Christopher Danilewicz, Ash; John Edward Glyn Kemp, Canterbury; Michael Snarey, Sandwich, and James Robert Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

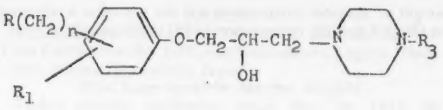
Division of Ser. No. 196,729, Nov. 8, 1971, Pat. No. 3,856,794. This application Aug. 2, 1974, Ser. No. 494,205

Claims priority, application United Kingdom, Nov. 10, 1970, 53303/70

Int. Cl.² A61K *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A method for lowering blood pressure in the treatment of a hypertensive subject, which comprises administering to said subject an effective blood pressure lowering amount of a compound selected from the group consisting of a phenoxypropanolpiperazine base of the formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein $R(CH_2)_n$ is at the 2- or 4- position on the phenyl ring; R of $R(CH_2)_n$ is carboxy, carbamoyl or alkanoylamino having from one to six carbon atoms and *n* is an integer of from one to two, inclusive; R_1 is hydrogen or a straight chain alkyl having from one to six carbon atoms, and R_3 is chlorophenyl or alkoxyphenyl having from one to six carbon atoms in the alkoxy moiety.

3,930,005
ANTIINFLAMMATORY AGENTS AND THEIR USE

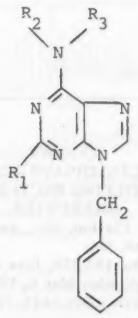
Robert John Wojnar, East Windsor; Russell James Brittain, Pennington; Jack Bernstein, and Kathryn Alice Losee, both of New Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 15, 1973, Ser. No. 370,487

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **12 Claims**

1. A method for treating inflammation which comprises administering to a mammal in need of said treatment a composition containing a pharmaceutical carrier and about 1 to 50 mg. per kg. of body weight of a compound of the formula



wherein R_1 is hydrogen, halogen, lower alkyl, lower alkoxy, amino, lower alkylamino or di-lower alkylamino, and R_2 and R_3 each is hydrogen or lower alkyl.

3,930,006

ANTIPARKINSONISM COMPOSITIONS AND METHOD

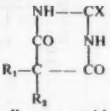
Leslie Frederick Wiggins, Wargrave; John William James, Langley, and Maurice Ward Gittos, Slough, all of England, assignors to Aspro-Nicholas Limited, Slough Bucks, England

Division of Ser. No. 276,977, April 30, 1963, abandoned, which is a continuation-in-part of Ser. No. 75,911, Dec. 15, 1960, abandoned. This application July 22, 1965, Ser. No. 510,108

Int. Cl.² A61K *31/40*, *31/445*, *31/495*, *31/515*, *31/535*

U.S. Cl. 424—254 20 Claims

1. A method of ameliorating symptoms of paralysis agitans comprising administering to a subject exhibiting the syndrome thereof an effective dose of a compound having anti-Parkinsonism activity selected from the group consisting of a compound of the formula



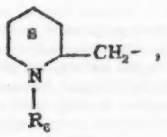
and a pharmaceutically acceptable salt thereof, in which formula X is selected from the group consisting of oxygen and sulphur, R_1 is selected from the group consisting of:

A.

wherein R_3 and R_4 are selected from the group consisting of methyl and ethyl, and A is selected from the group consisting of 2-ethylene and 3-propylene;

B. B N—A—, wherein B N— is selected from the group consisting of pyrrolidino, piperidino, morpholino, piperazino and homopiperazino, and A is selected from the group consisting of 2-ethylene and 3-propylene; and

C.



wherein R_6 is selected from the group consisting of hydrogen and methyl; and R_2 is phenyl.

3,930,007

PESTICIDAL BIS-PYRIDYL AMINE DERIVATIVES

Charles Brian Barlow, Camberley, and Clive Dudley Spencer Tomlin, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

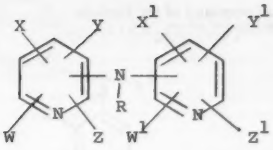
Division of Ser. No. 164,082, July 19, 1971, Pat. No. 3,830,822. This application May 13, 1974, Ser. No. 469,599

Claims priority, application United Kingdom, Aug. 4, 1970, 37585/70

Int. Cl.² A01N *9/22*

U.S. Cl. 424—263 9 Claims

1. An insecticidal, miticidal, fungicidal or bacteriacidal composition comprising, as active ingredient, an effective insecticidal, miticidal, fungicidal or bactericidal amount of a compound of the formula:



wherein R represents hydrogen or methyl; X, Y, Z and W are halogen and X^1, Y^1, Z^1 and W^1 represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, trifluoromethyl, alkoxy containing up to 8 carbon atoms, benzyloxy, phenoxy, ethoxyethoxy, methylthio, phenylthio, methylamino, ethylamino, dimethylamino, methanesulphonyl, carboxyl, carboxylic acid methyl ester or carbamyl provided that all but one of Y^1 X^1, Z^1 and W^1 are halogen; potassium or triethyl ammonium salts of such compounds or the N-oxides of such compounds, and a major amount of a carrier therefor.

3,930,008

4-ARYL-5-AMINOALKYL-4-OXAZOLIN-2-ONES

Elso Manghisi, and Giuseppe Cascio, both of Monza, Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

Filed Oct. 3, 1973, Ser. No. 403,275

Claims priority, application Italy, Oct. 16, 1972, 30536/72; Aug. 22, 1973, 28115/73

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PH 1 Claim

1. A 4-aryl-5-aminoalkyl-4-oxazolin-2-one selected from the group consisting of 4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 4-p-fluorophenyl-5-β-(4-o-methoxy-phenyl-piperazino)ethyl-4-oxazolin-2-one, 4-phenyl-5-β-(4-phenyl-piperazino)-ethyl-4-oxazolin-2-one, 4-p-chlorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 4-p-methoxy-phenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-methyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-ethyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-butyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-benzyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-diethyl-aminoethyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-acetyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-benzoyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 4-p-fluorophenyl-5-β-[4-(2 pyridyl)-piperazino] ethyl-4-oxazolin-2-one, 4-p-fluorophenyl-5-β-(4-methyl-piperazino) ethyl-4-oxazolin-2-one, 3-phenyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino) ethyl-4-oxazolin-2-one, 3-methylamino-carbonyl-4-p-fluorophenyl-5-β-(4-phenyl-piperazino)ethyl-4-oxazolin-2-one, 3-acetyl-4-p-fluorophenyl-5-β-(4-o-methoxyphenyl-piperazino)ethyl-4-oxazolin-2-one, 4-p-fluorophenyl-5-β-(4-phenyl-piperazino)ethyl-4-oxazolin-2-thione, 4-p-fluorophenyl-5-β-(4-o-methoxyphenyl-piperazino)ethyl-4-oxazolin-2-thione, 4-p-fluorophenyl-5-β-(4-phenylpiperazino) ethyl-2-imino-oxazoline, 4-p-fluorophenyl-5-β-(4-o-methoxyphenyl-piperazino)ethyl-2-imino-oxazoline, and a pharmaceutically acceptable salt thereof.

3,930,009

IMIDAZO(2,1-A)ISOINDOLES AS HYPOLIPIDEMICS

Alan R. Timms, Mendham, N.J., assignor to Sandoz-Wander, Inc. (Sandoz, Inc.), East Hanover, N.J.

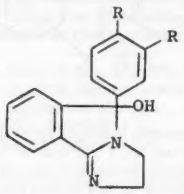
Filed June 25, 1973, Ser. No. 373,102

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 6 Claims

1. A method for lowering elevated triglyceride levels in blood which comprises orally or parenterally administering to a mammal in need of said treatment a triglyceride lowering

amount of a compound of the formula



where each R, independently, represents hydrogen or halo of atomic weight about 19–36, or an acid addition salt thereof.

3,930,010

FUNGICIDAL FORMULATIONS OF 2-BENZIMIDAZOLECARBAMIC ACID, ALKYL ESTERS

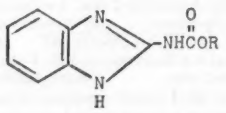
Hein Louis Klopping, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 260,196, June 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 861,791, Sept. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 727,036, May 6, 1968, abandoned, which is a continuation-in-part of Ser. No. 629,914, April 11, 1967, abandoned. This application Jan. 18, 1974, Ser. No. 434,556. The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl.² A01N 9/22

U.S. Cl. 424—273 **9 Claims**

1. A method for the curative and preventive control of fungus diseases of living plants or plant parts with a wide margin of safety to the plants comprising applying to the plants or plant parts a fungicidal amount of a compound of the formula:



where R is methyl or ethyl in a spray slurry or suspension containing a surfactant at or above its critical micelle concentration in said slurry or suspension, the surfactant being selected from the group consisting of polyhydric alcohol ester (CMC 40 ppm), sodium lauryl sulfate, stearyloxypolyethoxyethanol-20 E.O., polyethylene glycol 600 monostearate, potassium oleate, lauryloxypolyethoxyethanol-23 E.O., sodium N-methyl-N-oleyltaurate, N-lauryl betaine, polyoxyethylene (20) sorbitan monostearate, polyoxyethylene (20) sorbitan monolaurate, polyoxyethylene (30) stearate, dodecylphenoxypolyethoxy ethanol (CMC 15 ppm), fatty alkylol amide condensate (CMC 70 ppm), modified alkanolamide (CMC 220 ppm), cetyloxypolyethoxy ethanol 10 E.O., sodium lauryl ether sulfate 4 E.O., stearyloxypolyethoxy ethanol 10 E.O., polyethylene glycol 200 monolaurate, polyethylene glycol 400 monolaurate, sodium N-coco-β-aminopropionate (CMC 44 ppm), and sodium dodecyl benzene sulfonate.

3,930,011

PYRAZOLIUM FUNGICIDES

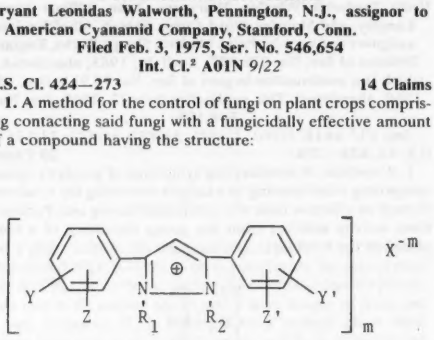
Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,654

Int. Cl.² A01N 9/22

U.S. Cl. 424—273 **14 Claims**

1. A method for the control of fungi on plant crops comprising contacting said fungi with a fungicidally effective amount of a compound having the structure:



wherein R_1 is methyl; R_2 is C_1-C_3 alkyl, allyl, propynyl, ethylcarboxymethyl, phenyl or benzyl; Y, Y', Z and Z' each represent a member selected from the group consisting of hydrogen, halogen, C_1-C_4 alkyl and C_1-C_4 alkoxy; X represents an anion having a charge of 1 or 2; and m is 1 or 2.

3,930,012

COMPOSITION AND METHOD OF PRODUCING INFERTILITY IN MALE RODENTS

Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 93,383, Nov. 27, 1970, abandoned. This application Aug. 8, 1973, Ser. No. 386,536

Int. Cl.² A01N 9/28

U.S. Cl. 424—278 **3 Claims**

1. A pharmaceutical preparation in the form of an oral ration for rodents consisting essentially of an effective amount for producing epididymal lesions and infertility in male rodents of 4-(chloromethyl)-2-oxo-1,3-dioxolane for preventing impregnation of receptive sexually mature female rodents by the male counterparts thereof, compounded with an ingestible bulking agent acceptable to said rodents, said ration providing at least about 5 mg./kg. of male rodent body weight.

3,930,013

FLUORO-DIOXOLANE ANESTHETIC COMPOUND AND METHOD

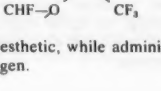
Ross C. Terrell, Plainfield, and George L. Moore, South Plainfield, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Division of Ser. No. 168,401, Aug. 2, 1971. This application Apr. 5, 1973, Ser. No. 348,407

Int. Cl. A61k 27/00

U.S. Cl. 424—278 **2 Claims**

2. A method of anesthetizing an anesthetic-susceptible mammal which comprises administering to the mammal an anesthetically-effective amount of a cyclic ether compound of the formula



as an inhalation anesthetic, while administering life-supporting amounts of oxygen.

3,930,014

PHARMACEUTICAL COMPOSITIONS

David Cecil Aldridge; Antony Borrow, and Ernest Edward Lawrence Gerring, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

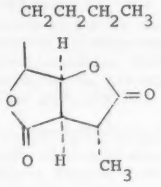
Filed Mar. 8, 1974, Ser. No. 449,555

Claims priority, application United Kingdom, Mar. 29, 1973, 15154/73

Int. Cl.² A61K *31/34*

U.S. Cl. 424—285 3 Claims

1. A pharmaceutical composition for internal use in the treatment of gastric or duodenal ulcers which comprises as active ingredient an effective amount of the compound dihydrocanadensolide having the formula:



together with a pharmaceutically acceptable diluent or carrier.

3,930,015

SLIMICIDAL COMPOSITIONS CONTAINING 2,2-DIBROMO-3-NITRILOPROPIONAMIDE AND THEIR USE

Paul Swered, and Mary Anne Girard, both of Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 30, 1975, Ser. No. 545,680

Int. Cl.² A01N *9/00, 9/20*

U.S. Cl. 424—298 8 Claims

1. A composition for the control of the microorganism Aerobacter aerogenes in aqueous systems comprising a mixture of 1,3-dichloroacetone oxime acetate, and 2,2-dibromo-3-nitrilopropionamide wherein the weight ratio of the acetate to the nitrilopropionamide ranges from about 95:5 to about 5:95 respectively.

3,930,016

PHARMACEUTICAL PREPARATIONS CONTAINING AMINES USEFUL FOR TREATMENT OF CARDIOVASCULAR DISEASES

Peder Bernhard Berntsson, Vastra Frolunda; Arne Elof Brändström, Goteborg; Enar Ingemar Carlsson, Kungsbacka; Stig Åke Ingemar Carlsson, Molnlycke; Lars Ek, Kungsbacka; Benny Roger Samuelsson, Pixbo; Sven Erik Sjöstrand, Kungsbacka; Gert Christer Strandlund, Molndal, and Bengt Arne Hjalmar Åblad, Goteborg, all of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

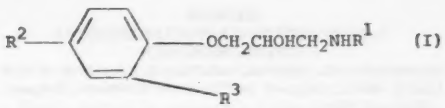
Filed July 6, 1973, Ser. No. 376,947

Claims priority, application Sweden, July 6, 1972, 8927/72

Int. Cl.² A61K *31/27, 31/17*

U.S. Cl. 424—300 42 Claims

1. A pharmaceutical preparation for the treatment of cardiovascular diseases by the use of a cardioselective antagonist for adrenergic β-receptor stimulation, containing as a therapeutic component an amine of formula I in an amount in the range of 0.1 to 95% by weight of said preparation, effective to provide said cardioselective antagonism for adrenergic β-receptor stimulation, together with a pharmaceutically acceptable carrier



(I)

wherein R^1 is lower alkyl or hydroxy lower alkyl, R^2 is carbamoylamino lower alkyl, mono lower alkyl carbamoylamino lower alkyl, di-lower alkyl carbamoylamino lower alkyl, carbamoylamino lower alkoxy, mono lower alkyl carbamoylamino lower alkoxy, di-lower alkyl carbomoylamino lower alkoxy, carbamoyloxy lower alkyl, mono lower alkyl carbamoyloxy lower alkyl, di-lower alkyl carbamoyloxy lower alkyl, carbamoyloxy lower alkoxy, mono lower alkyl carbamoyloxy lower alkoxy or di-lower alkyl carbamoyloxy lower alkoxy, and R^3 is hydrogen, halogen, lower alkyl, lower alkenyl, lower alkinyl, lower alkoxymethyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, lower alkenylthio, lower alkinylthio or lower acyl.

32. A method of treating cardiovascular diseases by the use of a cardioselective antagonist for adrenergic β-receptor stimulation comprising administering to a mammal an amount of a preparation according to claim 1 effective to provide said cardioselective antagonism for adrenergic β-receptor stimulation.

3,930,017

LOWERING BLOOD CHOLESTEROL AND LIPID LEVELS

Horst Kummer, Wilhelmbusch 47, 519 Stolberg, Rhineland, and Ruediger Beckmann, Elsa-Brandstrom-Strasse 10, 51 Aachen, both of Germany

Division of Ser. No. 584,089, Oct. 4, 1966, abandoned. This application May 22, 1970, Ser. No. 38,647

Claims priority, application Germany, Oct. 7, 1965, 1493567

Int. Cl.² A61K *31/24*

U.S. Cl. 424—309 7 Claims

1. The method of lowering blood cholesterol and lipid levels without increasing the basal metabolic rate and exhibiting no thyrotoxic activity in human patients which comprises administering orally a pharmaceutical composition which comprises 1 to 25 mg. dosage of dl-alpha-methylthyroxine ethyl ester and a pharmaceutically acceptable carrier to said patients.

3,930,018

FEED FOR PISCICULTURE

Masato Akasaki, Miyazaki; Hiroshi Takashima, and Kazuhiro Shibata, both of Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Oct. 31, 1973, Ser. No. 411,198

Claims priority, application Japan, Nov. 9, 1972, 47-112774

Int. Cl.² A61K *27/00*

U.S. Cl. 424—322 8 Claims

1. In a method for feeding catfish for the promotion of growth thereof in a pisciculture, the improvement which compirses: admixing 1–20% by weight of isobutylidene diurea into the feed, and feeding an effective growth promoting amount of the feed to said catfish.

3,930,019
2-(2-HALOPHEN OXY)ACETAMIDINES AS ANTIDEPRESSANTS

Abdulmuniem H. Abdallah, and Philip J. Shea, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 6, 1974, Ser. No. 521,436
Int. Cl.² A61K *31/155*
U.S. Cl. 424—326 **5 Claims**

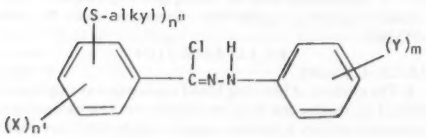
1. A method useful for alleviating symptoms of central nervous system depression in animals comprising administering to an animal suffering from central nervous system depression an amount of a compound selected from the group consisting of a 2-(2-haiophenoxy) acetamidine and a pharmacologically-acceptable salt thereof effective to alleviate said symptoms.

3,930,020
COMPOSITIONS AND METHODS OF COMBATTING ARTHROPODAL PESTS USING PHENYLHYDRAZONE DERIVATIVES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 13, 1970, Ser. No. 54,622
Int. Cl.² A01N *9/20*
U.S. Cl. 424—327 **21 Claims**

1. A method of controlling arthropod pests which comprises contacting the pests or applying to a situs an effective anti-arthropodal amount of an ar or ar' (alkylthio) benzoyl chloride phenylhydrazone having the structural formula:



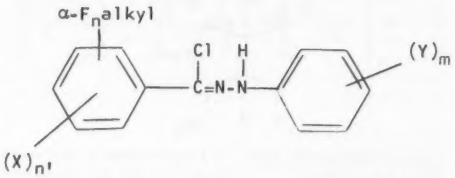
wherein "alkyl" is of from 1 to 6 carbon atoms, inclusive: X is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, alkylthio of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl of from 1 to 3 carbon atoms, inclusive, wherein n is the integer 2 or 3, or nitro; Y is alkyl of from 1 to 6 carbon atoms, inclusive, halogen, alkylthio of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl of from 1 to 3 carbon atoms, inclusive, or nitro; n' is an integer 0 to 3, inclusive; n'' is 1 except when Y is alkylthio, when it can be zero; and m is an integer from 0 to 3, inclusive, the sum of $n'+n''+m$ being not more than 6, the sum of carbon atoms in the alkyl substituents being not more than 15, there being no more than one nitro group in the molecule, and no more than two α-$F_n$alkyl groups on any benzene ring or three total.

3,930,021
COMPOSITIONS AND METHODS OF COMBATTING ARTHROPODAL PESTS USING PHENYLHYDROZONE DERIVATIVES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed July 13, 1970, Ser. No. 54,620
Int. Cl.² A01N *9/20*
U.S. Cl. 424—327 **17 Claims**

1. A method of combatting arthropod pests which comprises contacting the pests with an effective anti-arthropodal amount of an (α-fluoroalkyl)benzoyl chloride phenylhydrazone having the structural formula:



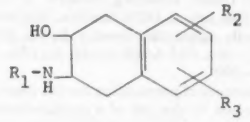
wherein α-$F_n$alkyl is an α-fluoroalkyl group of from 1 to 3 carbon atoms, inclusive; n is the integer 2 or 3; X is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl, or nitro; Y is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, α-$F_n$alkyl, or nitro; n' is an integer from 0 to 3, inclusive; and m is an integer from 0 to 3, inclusive; the sum of $n' + m$ being not more than 5, the sum of carbon atoms in alkyl substituents being not more than 15, there being no more than one nitro group in the molecule, and no more than two α-$F_n$alkyl groups on any one benzene ring or three total.

3,930,022
CERTAIN TETRAHYDRONAPHTHALENES USED IN THE TREATMENT OF CARDIAC ARRHYTHMIA

Frederic Peter Hauck, Somerville; Christopher M. Cimarusti, Hamilton, both of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 268,314, July 3, 1972, abandoned. This application June 20, 1974, Ser. No. 481,089
Int. Cl.² A61K *31/135*
U.S. Cl. 424—330 **18 Claims**

1. A method of treating cardiac arrhythmia which comprises administering to a mammalian host an effective amount of a compound having the formula



or a pharmaceutically acceptable acid addition salt thereof; wherein the hydroxyl and amino groups attached to the non-aromatic ring are in the trans configuration; wherein R_1 is alkyl or arylalkyl; and R_2 and R_3 are each hydrogen, hydroxyl,

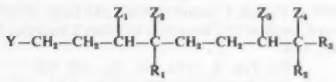
alkoxy or arylalkoxy; wherein aryl is phenyl or phenyl mono- or di-substituted with halogen, alkyl or alkoxy and wherein all alkyl and alkoxy groups contain one to eight carbon atoms.

3,930,023
INSECT CONTROL WITH CERTAIN SYNTHETIC HORMONES

Thomas L. Emmick, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 187,890, Oct. 8, 1971, Pat. No. 3,825,661, which is a continuation-in-part of Ser. No. 877,019, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 787,281, Dec. 26, 1968, abandoned. This application July 3, 1974, Ser. No. 485,485
Int. Cl.² A01N 9/24
U.S. Cl. 424—341 6 Claims

1. A method for controlling the development of an insect species that is a member of an order selected from the group consisting of Coleoptera, Diptera, Orthoptera, Hemiptera, Homoptera and Lepidoptera which comprises treating, by contact or ingestion, an immature form of the insect species with a maturation-inhibiting amount of a compound having the formula



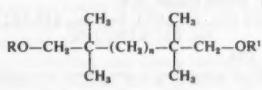
wherein each of R_1, R_2 and R_3 is a C_1-C_3 alkyl group;
each of Z_1, Z_2, Z_3 and Z_4 separately is hydrogen or halogen, or Z_1 and Z_2 together or Z_3 and Z_4 together are a carbon to carbon bond; and
Y is phenyl or substituted phenyl wherein the substituents are fluoro, chloro, bromo, carboethoxy, cyano, methoxy, ethoxy, C_1-C_4 alkyl, or dimethylamino.

3,930,024
PHARMACEUTICAL COMPOSITIONS AND METHODS

Paul L. Creger, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 193,215, Oct. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 854,757, Sept. 2, 1969, abandoned. This application Nov. 27, 1974, Ser. No. 527,934
Int. Cl.² A61K 31/045
U.S. Cl. 424—343 11 Claims

1. A pharmaceutical composition in dosage unit form possessing serum triglyceride-lowering activity, serum cholesterol lowering activity and suitable for internal administration, comprising a pharmaceutical carrier and 20 to 5,000 mg. per dosage unit of a compound of the formula



where *n* is 6, 7, 8, 9, or 10; and R and R^1 are selected from the group consisting of hydrogen, acyl radicals of hydrocarbon monocarboxylic acids containing 1 to 12 carbon atoms, acyl radicals of hydrocarbon dicarboxylic acids containing 4 to 6 carbon atoms, phenylalanyl, and phosphono.

3,930,025
PENTACHLOROPHENOL-CREOSOTE WOOD-PRESERVATIVE

Denton M. Albright, Penn Hills Township, Allegheny County, and Charles Willard Leach, Penn Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed July 1, 1971, Ser. No. 159,012
Int. Cl.² A01N 9/00, 9/26
U.S. Cl. 424—346 5 Claims

1. A creosote-pentachlorophenol wood preservative solution consisting essentially of creosote having a maximum tar base content of 7.5 meq/100 g oil and pentachlorophenol, said phenol being about 1 to about 6 weight percent of said creosote.

3,930,026
CHEWING GUM HAVING ENHANCED FLAVOR

K. Warren Clark, Brewster, N.Y., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 28, 1974, Ser. No. 501,325
Int. Cl.² A23G 3/00, 3/30
U.S. Cl. 426—3 4 Claims

1. A chewing gum comprising a gum base having incorporated therein particles of flavor and particles of an edible non-ionic surfactant, the flavor particles and the edible surfactant particles being jointly sorbed in an edible hydrophilic colloid.

3,930,027
PROCESS FOR PREPARING A PRECOOKED DEHYDRATED PRODUCT

Vincent J. Kelly; Larry L. Cloud, and Wayne J. Smalligan, all of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Continuation of Ser. No. 177,903, Sept. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 54,851, July 14, 1970, abandoned. This application Nov. 16, 1973, Ser. No. 416,562
Int. Cl.² C12B 1/00
U.S. Cl. 426—28 8 Claims

1. A process for preparing a precooked, dehydrated product comprising: adjusting the temperature of a slurry of gelatinized starch into the range of activity exhibited by amylase; contacting sufficient of said amylase with said slurry to completely hydrolyze said gelatinized starch; combining a quantity of a slurry of non-hydrolyzed starch with a quantity of a slurry of said completely hydrolyzed starch wherein the combined quantities of ingredients create a maltose concentration of about 14% based on total weight of slurry; and drying said combined slurry to provide said dehydrated product.

3,930,028
PROCESS FOR THE MICROBIOLOGICAL PURIFICATION OF DAIRY EFFLUENTS

Agnes Ullmann, and Maxime Schwartz, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 4, 1973, Ser. No. 366,458
Claims priority, application France, June 8, 1972, 72.20697
Int. Cl.² A23C 5/00; C02C 1/02; A23J 1/20; A23K 1/08
U.S. Cl. 426—41 7 Claims

1. A process for purifying dairy effluents, comprising fermenting the effluents with at least one non-pathogenic, aerobic, proteolytic bacterial strain of the family Enterobacteriaceae having a least one B-galactosidase or one lactose-oxidase in a container at a temperature of from about 20°–37°C, and separating the bacterial matter from the fermentation liquors.

3,930,029

METHOD OF MANUFACTURING QUICK-SOLUBLE GELATINIZED POWDERED GRAIN

Junichi Minami, Tondabaya; Mitsumune Takatsu, Kusatsu; Masaki Terada, Osaka; Tsuneo Takeuchi, Osaka, and Yutaka Takagi, Osaka, all of Japan, assignors to Nissin Shokuhin Kaisha, Ltd., Japan

Filed Mar. 11, 1974, Ser. No. 450,243
Int. Cl.² A21D 8/04
U.S. Cl. 426—44 3 Claims

1. A method for manufacturing a quick-soluble gelatinized powdered foodstuff selected from the group consisting of wheat flour, powdered rice and white potato starch comprising the steps of forming a paste by adding to wheat flour, powdered rice or white potato starch, an aqueous solution of a proteolytic enzyme composition containing amylase and protease and sodium chloride; mixing and kneading said paste for about 15 to 20 minutes, the amount of said enzyme composition and the temperature of said mixing and kneading being sufficient to effect zymolysis; forming said paste into strips, boiling or steaming said strips and then frying said boiled or steamed strips at a temperature of up to 155°C to effect dehydration thereof and then comminuting the resultant product.

3,930,030

PROCESS FOR MAKING A BARBECUE SAUCE WITH TENDERIZER

Ferdinand E. Metz, Glenshaw; Finis O. Boyce, Bridgeville, and James L. Segmiller, Pittsburgh, all of Pa., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Feb. 27, 1975, Ser. No. 553,669
Int. Cl.² A23L 1/31
U.S. Cl. 426—63 2 Claims

1. A process for making a barbacue sauce for tenderizing and enhancing the flavor of protein-containing food consisting of

a. providing an aqueous mixture of spices and preservatives at about 160°F.,
b. adding tomato paste, sugar, gum-oil and salt to said mixture with agitation while maintaining the temperature thereof between 175° – 190°F. for about 15 minutes,
c. milling said mixture at about 180°F.,
d. deaerating and cooling said mixture to 120°F., and then
e. adding vinegar, oils, garnishes and papain substantially free of amylase to said mixture with agitation while maintaining the temperature thereof at about 120°F., and thereby bringing the mixture to a pH of about 3.5.

3,930,031

SYNERGISTIC FLAVOR ENHANCING COATINGS FOR CAT FOOD COMPOSITIONS COMPRISING CITRIC AND PHOSPHORIC ACIDS

Richard D. Kealy, Waterloo, Ill., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 487,526, July 11, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 563,938
Int. Cl.² A23K 1/18
U.S. Cl. 426—89 32 Claims

1. A cat food composition comprising a nutritionally balanced mixture of proteinaceous and farinaceous ingredients having a coating of a synergistically effective flavor enhancing mixture which comprises between about 87 to 13 parts by weight of phosphoric acid to 1 part by weight of citric acid, wherein said coating is applied to provide a level of phosphoric acid in said cat food composition of at least about 0.5% by weight.

3,930,032

BAKING POWDER OF IMPROVED STABILITY AND METHOD OF PRODUCING SAME

Norman E. Harris, Waltham; Anthony P. Umina, Hopkinton, and Donald E. Westcott, West Acton, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,954
Int. Cl.² A23F 1/06
U.S. Cl. 426—97 10 Claims

1. A baking powder of improved stability which comprises, a sodium bicarbonate leavening agent and an acidic leavening agent, both types of leavening agent being in the form of finely divided particles, said finely divided particles of both types of leavening agent being coated with a composition comprising a mixture of (1) a cellulose ether selected from the group consisting of hydroxypropylmethylcellulose containing from about 4 to about 12 percent of 2-hydroxypropyl groups and from about 19 to about 30 percent of methoxyl groups and methylcellulose containing from about 27.5 to about 31.5 percent methoxyl groups, (2) ethyl cellulose containing from about 45.0 to about 49.5 percent of ethoxyl groups, and (3) a solvent which is compatible with components (1) and (2), and thereafter freed of said solvent wherein the moisture content of the baking powder is below about 5%.

3,930,033

SIMULATED BACON PRODUCT AND PROCESS THEREFOR

Glenn Arthur Corliss, Clarendon Hills, and Henry Paul Furgal, Lombard, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 4, 1974, Ser. No. 439,356
Int. Cl.² A23J 3/00; A23L 1/275
U.S. Cl. 426—103 11 Claims

1. A simulated bacon product having alternate expanded cooked layer simulating the lean and fat portions of bacon, the expanded layer simulating the lean portions being produced by cooking a composition mixture consisting essentially of 10 to 40 percent vegetable protein fiber, 5 to 20 percent egg albumen, 5 to 20 percent tapioca starch, 30 to 60 percent water, 3 to 20 percent vegetable oil, 0.1 to 1.5 percent vegetable gum, 2 to 15 percent vegetable protein isolate, 0.05 to 0.50 percent dextrose, 0.005 to 0.05 percent food grade coloring and 5 to 20 percent flavors and seasoning, said composition mixture also containing a gas dispersed therein, and the expanded layers simulating the fat portions being produced by cooking a composition mixture consisting essentially of 0 to 5 percent vegetable protein fiber, 5 to 20 percent egg albumen, 3 to 20 percent tapioca starch, 30 to 60 percent water, 10 to 40 percent vegetable oil, 0.1 to 1.5 percent vegetable gum, 2 to 15 percent vegetable protein isolate, 4 to 15 percent sodium caseinate, 0.05 to 0.50 percent dextrose, and 5 to 20 percent flavors and seasonings, said composition mixture also containing a gas dispersed therein, said percents being weight percent based on the total weight of the layer composition.

3,930,034

SIMULATED STRAWBERRY SLICES AND METHOD OF PREPARING THE SAME

Sudhakar P. Shanbhag, Tarrytown, and Alina S. Szczesniak, Mount Vernon, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,582
Int. Cl.² A23G 1/00
U.S. Cl. 426—104 12 Claims

1. A method of preparing a simulated strawberry colored food stuff which comprises peeling and slicing into pieces plant tissue composed mainly of large, thin-walled, loosely arranged parenchyma cells and infusing the plant tissue pieces with an aqueous water binding solution containing an effective amount of strawberry color and an amount of at least one edible polyhydric alcohol selected from the group consisting

of glycerol, 1,3 - butylene glycol, propylene glycol, sucrose, dextrose, fructose and sorbitol sufficient to impart a water activity to the plant tissue of from about 0.3 to about 0.85 and a moisture content of about 10 to about 52%, said water binding solution having been infused into the plant tissue pieces for a period of time effective to allow infusion of the strawberry colored solution to become complete thereby imparting strawberry color to the outside of the piece with a progressively decreasing strawberry color intensity the further the solution infuses into said piece and thereafter further slicing said infused piece.

3,930,035
EDIBLE COLLAGEN SAUSAGE CASING AND PROCESS FOR PREPARING SAME

Noel I. Burke; Arthur M. Dowell, Jr.; Robert D. Talty, and Kenneth J. Kremer, all of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Oct. 15, 1974, Ser. No. 514,686
Int. Cl.² A23L *1/31*
U.S. Cl. 426—140 **8 Claims**

1. A process for preparing an edible collagen sausage casing wherein a collagen slurry is formed from a collagen source, extruded through an annular die, coagulated, first tanned in a bath with an aluminum tanning agent and subsequently tanned with glutaraldehyde which comprises,

conducting said first tanning of said collagen by contacting said casing in a tanning bath containing from 0.3 – 1.25% aluminum calculated as $Al_2(SO_4)_3 \cdot 14H_2O$ for about 2 – 15 minutes;

conducting said subsequent tanning of said first tanned casing by contacting said casing in a bath containing from 80 – 300 ppm glutaraldehyde and having a pH of from about 4.1 – 4.5 for a time sufficient to effect substantially complete dynamic equilibrium between said casing and said bath;

precipitating uncombined aluminum in said tanned casing by passing said tanned casing through a bath at a pH of 7.8 – 8.2, and then drying said tanned casing after precipitating said aluminum.

3,930,036
EDIBLE COLLAGEN SAUSAGE CASING AND METHOD OF PREPARING SAME

Noel I. Burke, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed July 12, 1974, Ser. No. 487,831
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—140 **9 Claims**

1. In a method of preparing edible tubular collagen sausage casings which comprises:

a. grinding animal hide collagen to form an aqueous slurry,

b. treating the slurry with acid at a pH of 2.5 – 3.7 to swell the collagen,

c. extuding the slurry at a collagen content of 2 – 8% through an annular die into a coagulation bath to form a tubular gel collagen casing,

d. tanning the gel casing in two steps first in a tanning bath of an aluminum salt solution and then in a dilute solution of glutaraldehyde, and

e. washing, plasticizing, and drying the casing to produce a translucent non-fibrous edible product, the improvement which comprises:

treating the gel collagen casing with a dilute solution of an acid orthophosphate salt at pH 6 – 8 after the final tanning step and prior to drying, whereby the free aluminum in the gel casing is converted to an insoluble aluminum phosphate.

3,930,037
PROCESS FOR PREPARING MIXTURES OF CAROTENOID PIGMENTS

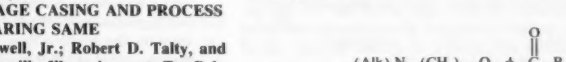
Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,864,501. This application Oct. 9, 1974, Ser. No. 513,665
Int. Cl.² A23L *1/272*
U.S. Cl. 426—268 **6 Claims**

1. A process for preparing a mixture of carotenoid pigments, which comprises —

a. removing the peel from a citrus fruit,

b. coating the peel from an aqueous solution of a compound of the structure



wherein Alk is lower alkyl of 1 to 4 carbon atoms, *n* is an integer from 2 to 4, and R is a member of the group consisting of H, lower alkyl of 1 to 4 carbon atoms, phenyl, —CH=CH—Ph, and —CH_2—CH_2—Ph,

c. holding the peel until the carotenoid content thereof has been substantially increased, and

d. extracting the carotenoid pigments from the peel.

3,930,038
METHOD FOR COLORING FRUITS AND VEGETABLES

Henry Yokoyama; Wan-Jean Hsu, both of Pasadena, and Stephen M. Poling, Seal Beach, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 404,980, Oct. 10, 1973, Pat. No. 3,864,501. This application Oct. 9, 1974, Ser. No. 513,360
Int. Cl.² A23L *1/272*
U.S. Cl. 426—269 **3 Claims**

1. A process for enhancing the coloration of harvested fruits and vegetables which contain carotenogenic tissue, which comprises —

a. applying to the surface of the harvested fruit or vegetable a compound of the structure

$Et_2N—CH_2—CH_2—S—Et$

b. and holding the fruit or vegetable for a period long enough to develop an enhanced coloration.

3,930,039
METHOD OF PREPARING A PROTEIN CONCENTRATE FROM WHEY

Arie Kuipers, Reitmehring, Germany, assignor to Molkerei J. A. Meggle, Milchindustrie, Reitmehring, Germany

Continuation of Ser. No. 185,441, Sept. 30, 1971, abandoned. This application Apr. 25, 1974, Ser. No. 463,868
Claims priority, application Germany, July 30, 1971, 2138277
Int. Cl.² A23C *21/00*, *9/14*
U.S. Cl. 426—271 **8 Claims**

3. A method of preparing a protein concentrate from whey which comprises:

a. adjusting the pH of said whey to a value lower than the isoelectric point of the protein in said whey;

b. subjecting said whey at the adjusted pH value to ultrafiltration through a filtering medium, thereby passing a filtrate through said medium and separating said filtrate from a liquid concentrate retained by said medium,

1. said concentrate containing a higher percentage of solids than said filtrate, and

2. the weight ratio of protein to whey solids of a molecular weight lower than the molecular weight of said protein being higher in the solids of said concentrate than in the solids of said filtrate; and

c. heating said concentrate at said adjusted pH value to a temperature of at least 70°C until sterile.

6. A method as set forth in claim 3, wherein said pH of said whey is adjusted to said lower value by substitution of hydrogen ions for cations other than hydrogen in said whey.

3,930,040

PROCESS OF STORING OR SHIPPING FRESH MEAT IN A MODIFIED GASEOUS ATMOSPHERE

Richard E. Woodruff, Salinas, Calif., assignor to TransFRESH Corporation, Salinas, Calif.

Filed Sept. 16, 1974, Ser. No. 506,454
Int. Cl.² A23L *1/31*
U.S. Cl. 426—312 **5 Claims**

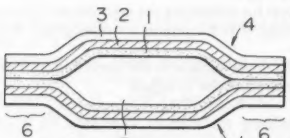
1. In the process of storage or shipment of fresh meat refrigerated to a temperature in the range of 29°–40° F., the improvement which consists essentially of maintaining said meat in a modified gaseous atmosphere of carbon dioxide, about 10–75% by volume, molecular oxygen, about 2½–30% by volume; carbon monoxide, about 1–10% by volume; and the remainder essentially molecular nitrogen during the period of storage or shipment.

3,930,041

HERMETIC SEALING PROCESS UTILIZING MULTIPLE HEAT-SEALING STEPS

Yoshihiro Komatsu, Kawasaki; Izumi Kakuta, Tokyo, and Kanemichi Yamaguchi, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Apr. 24, 1973, Ser. No. 354,121
Claims priority, application Japan, Apr. 27, 1972, 47-42372; Apr. 27, 1972, 47-42373
Int. Cl.² C09J *5/00*; B65B *7/06*; B32B *31/20*
U.S. Cl. 426—396 **18 Claims**



13. A hermetic sealing process for forming a heat-sterilizable packaged article by deaerating and heat-sealing a packaged article comprising a container having a heat-sealable resin coating on the inner surface of an area to be heat-sealed, and contents composed of cooked or semicooked foods containing a liquid filled in said container under such an atmosphere that an easily-condensable vapor or a condensate thereof resulting from the presence of the liquid is present on innerfaces to be heat-sealed, said process comprising applying to the area to be heat-sealed of the packaged article heat-sealing temperature T_1 (°C.) and pressure P_1 (Kg/cm²) necessary for melting and press-bonding the heat-sealable resin coating, then applying to the formed heat-sealed area a heat-seal bar temperature T_2 (°C.) which is lower than the temperature T_1 applied at the first heat-sealing step but higher than the temperature at which the heat-sealable resin coating begins melting or softening and a pressure P_2 (Kg/cm² gauge) which is higher than the pressure P_1 applied during the first heat-sealing step and also higher than the saturated vapor pressure of the easily-condensable vapor corresponding to said temperature T_2 to effect condensation of vapor disposed within the area sealed by the first heat-sealing step, and cooling the heat-sealed area under an elevated pressure.

3,930,042

PRODUCTION OF VODKA

William Dunnet, Menstrie, Scotland, assignor to The Distillers Company, Limited, Linden, N.J.

Filed Dec. 14, 1973, Ser. No. 425,030
Int. Cl.² C12G *3/00, 3/12*
U.S. Cl. 426—475 **13 Claims**

1. A process for the treatment of aqueous ethyl alcohol which comprises:

a. downwardly flowing aqueous ethyl alcohol being aqueous commercial grain neutral spirits having a pH of about 7, and being obtained by fermentation, distillation, and rectification processes and containing small quantities of impurities which adversely affect aroma and taste of the alcoholic beverage;

b. upwardly flowing a carbon dioxide-containing gas consisting essentially of carbon dioxide countercurrently to said aqueous ethyl alcohol;

c. wherein the relative flow rate of carbon dioxide to the aqueous ethyl alcohol is sufficient to provide an aqueous alcohol having a pH between about 4.0 and about 5.5,

d. wherein the relative flow rate of the aqueous ethyl alcohol is from about 2 to about 30 gallons per minute and the flow rate of the carbon dioxide is between about 10 and about 200 cubic feet per minute;

e. wherein the contact time between the countercurrently flowing carbon dioxide-containing gas and aqueous ethyl alcohol is between about 20 seconds and 180 seconds;

f. then passing the carbon dioxide-containing gas containing a substantial amount of vapors of ethyl alcohol, water and the impurities through an adsorption bed consisting of dry solid particles in order to remove the impurities from the gas stream;

whereby an aqueous ethyl alcohol product having a pH between about 4.0 and about 5.5 without distinctive aroma and taste, and which is suitable for use as vodka, is obtained; and

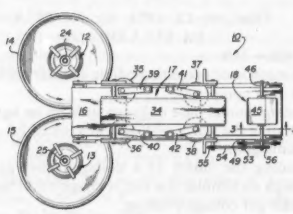
g. reusing the carbon dioxide-containing gas for countercurrent flow with fresh quantities of said aqueous ethyl alcohol.

3,930,043

METHOD FOR MAKING COTTON CANDY

Walter B. Warning, Chicago, and Walter B. Warning, Jr., Schaumburg, both of Ill., assignors to Tec-Pak Corporation, Schiller Park, Ill.

Filed July 19, 1973, Ser. No. 380,566
Int. Cl.² A23P *1/00*; B29C *23/00*; A23G *3/00, 3/10*
U.S. Cl. 426—515 **4 Claims**



1. A method of making cotton candy comprising the steps of

extruding melted sugar through a plurality of appertures in a rotating head to provide continuous strands of sugar,

collecting said strands in a rotating pan in the center of which said head is disposed,

pulling the collected strands upwardly from said pan onto a conveyor belt mounted at the side of said pan and traveling in a direction tangential to said pan at a linear speed

slightly greater than the tangential speed at the periphery of said pan,

carrying the collected strands on said conveyor through a compactor to size the collected strands to a predetermined height and width, and

cutting the sized product into sections of predetermined length.

3,930,044

IN SITU PRODUCTION OF MEAT LIKE FLAVOR IN EXPANDED POROUS FOOD PRODUCT

Paul van de Rovaart, Chexbres, and Jean-Jacques Wuhrmann, Saint-Legier, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 20, 1973, Ser. No. 417,503

Claims priority, application Switzerland, Nov. 21, 1972, 16909/72

Int. Cl.² A23L *1/231*

U.S. Cl. 426—533 **17 Claims**

1. A process for preparing an expanded porous food product having a meat-like flavour, which comprises forming a mixture comprising

a. a finely divided carbohydrate or protein food material,

b. at least one pentose or hexose,

c. at least one sulfur-containing amino acid or an amino acid and a substance containing sulfide, and

d. water, the mixture containing from 18 to 45% by weight of water,

heating the mixture to a temperature of at least 150°C under a pressure which is at least equal to the saturated vapor pressure of water at the temperature to which the mixture is heated, whereby said constituents (b) and (c) react to impart a meat-like flavour, and thereafter rapidly reducing the pressure to which the mixture is subjected to vaporize the major proportion of the water contained in the mixture thereby forming an expanded porous structure in its interior.

3,930,045

IN SITU PRODUCTION OF MEAT LIKE FLAVOR IN EXTRUDED POROUS FOOD PRODUCT

Arthur Joseph Mosher, Paris Township, Union County, Ohio, and Donald Eugene Yingst, Lausanne, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Nov. 20, 1973, Ser. No. 417,535

Int. Cl.² A23L *1/231*

U.S. Cl. 426—533 **17 Claims**

1. In a process for preparing an expanded porous food product which comprises:

A. forming a mixture of finely divided carbohydrate or protein food material with water and

B. extruding said mixture under conditions of elevated temperature and pressure,

the improvement which comprises blending reducing sugar and sulfur-containing substance with said mixture, the sulfur of said substance being in, or being readily transformable under said extrusion conditions into, a reactive sulfur radical and wherein said sugar and substance are in an amount sufficient to impart meat-like flavour to said food product and are in a ratio which stabilizes the extrusion flow rate.

3,930,046

PROCESS FOR PREPARING A MEAT FLAVORING

William Lewis Baugher, Logan Township, Dearborn County, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 3, 1974, Ser. No. 529,155

Int. Cl.² A23L *1/227, 1/231*

U.S. Cl. 426—533 **6 Claims**

3. A process for making a meat-like flavoring composition comprising:

a. reacting for from 3 minutes to 24 hours at a temperature of from 60° to 180°C a mixture of about 10 parts hydrolyzed whey protein, from about 0.8 to about 4 parts xylose and from about 0.8 to about 4 parts cysteine;

b. reacting for from 3 minutes to 24 hours at a temperature from 60° to 180°C a mixture of about 10 parts hydrolyzed whey protein and from about 0.8 to about 4 parts thiamine;

c. blending about 1 part of the product of step (a) with from about 0.1 to about 10 parts of the product of step (b).

3,930,047

FAT OR OIL COMPOSITION STABILIZED WITH POLYSTYRLPHENOL ANTIOXIDANT

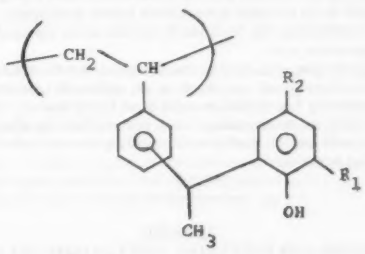
James A. Dale, Menlo Park, and William J. Leonard, San Francisco, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Mar. 11, 1974, Ser. No. 449,929

Int. Cl.² A23D *5/04*

U.S. Cl. 426—546 **3 Claims**

1. A stabilized food composition comprising an edible fat or oil normally subject to oxidative deterioration having intimately admixed therewith a polymer consisting essentially of n units of a monomer of the formula



wherein R_1 is a lower alkyl of from 1 to 5 carbons inclusive, R_2 is hydrogen or a lower alkyl of from 1 to 5 carbons, and n is an integer of from 3 to 2000, the amount of said polymer being in the range of about 0.001 to about 0.2 percent by weight of said fat or oil.

3,930,048

SWEETENING MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Norman Wookey, Epsom; Arthur Frederick Jackson, Ashford; Michael Clive Collins, Hamstreet, and Brian Francis, Faversham, all of England, assignors to Ranks Hovis McDougall Limited, London, England

Filed Jan. 9, 1974, Ser. No. 431,699

Claims priority, application United Kingdom, Jan. 17, 1973, 2501/73

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **12 Claims**

6. A method of producing a sweetening material in the form of porous agglomerates of spray-dried particles in which the essential components are dextrose and a synthetic sweetening agent, said material having substantially equivalent sweetening power to that of granulated sugar but a bulk density in the range of 0.2 to 0.75 gm/cc with a consequent low calorific value per unit of volume which comprises

feeding to a spray dryer (a) a liquid mixture comprising dextrose and said synthetic sweetening agent in the form of a water-base syrup and (b) a solid mixture in the form of powder of amorphous dextrose and said synthetic sweetening agent,

contacting said syrup and said powder as said mixture passes through said spray dryer whereby all or most of the

powder particles will pick up some of said syrup and will become sticky, and will agglomerate while drying;

screening said spray dried material so as to separate any unagglomerated powder together with agglomerates which are above and below a predetermined range of screen sizes, from the intermediate sized remainder and recovering the intermediate sized remainder.

3,930,049

PROCESS FOR PREPARING A SHELF-STABLE, FLEXIBLE TORTILLA

Peter H. Mattson, Hillsborough, Calif., assignor to S & W Fine Foods, Inc., San Mateo, Calif.

Continuation-in-part of Ser. No. 313,450, Dec. 8, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,876

Int. Cl.² A21D *15/00*

U.S. Cl. 426—549 **11 Claims**

1. A process for forming a packaged, fried, shelf-stable, flexible tortilla comprising the steps of

a. lightly frying a hot, pre-baked tortilla in oil at an elevated temperature for a time selected to sterilize said tortilla and retain at least 13.5% residual moisture in the tortilla for it to remain flexible, whereby the tortilla is capable of being formed into a spiral cross-section after frying while still at an elevated temperature before packaging,

b. maintaining the fried sterile tortilla at an elevated temperature, and

c. packaging and sealing the fried and sterile tortilla in a moisture-proof container at an elevated temperature, whereby the tortilla is capable of being heated in a hot liquid in the container to a temperature at which the tortilla can be readily removed from the container without breakage.

3,930,050

PROCESS FOR PREPARING LOW CALORIE GELATIN DESSERT WITH BROMELAIN

Berry V. Faber, 34 Yukon St., San Francisco, Calif. 94114

Filed Aug. 6, 1973, Ser. No. 386,125

Int. Cl.² A23L *1/04*

U.S. Cl. 426—564 **4 Claims**

1. In a process for preparing a low calorie gelatin dessert containing a hardening retardent in an amount sufficient to regard gel hardening selected from the group consisting of bromelain and papain, the steps of:

a. formulating a dry powder mix of ingredients including suitable amounts of gelátin, sweeteners, flavorings, and hardening retardent;

b. adding sufficient boiling water to the powder mix to dissolve all the ingredients;

c. allowing the solution to cool and form a gel; and thereafter

d. whipping the gel until creamy.

3,930,051

METHOD FOR PREPARING A PUDDING

Leonard R. Kahn, 70 N. Grove St., Freeport, L.I., N.Y. 11520

Continuation-in-part of Ser. No. 200,825, Nov. 22, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,952

Int. Cl.² A23L *1/187*

U.S. Cl. 426—573 **14 Claims**

1. A method for producing a pudding similar in texture and density to bread pudding which comprises; mixing approximately one part weight of a dry mixture consisting essentially of oat flakes having a size between 0.1 and 0.7 cm and having a specific gravity of approximately 0.3 to approximately 0.7 with two parts weight of an edible liquid so as to wet said oat flakes and allowing the resulting mixture to set prior to serving.

3,930,052

GELATIN COMPOSITIONS

Michel De Brou, Grimbergen, and Claude Den Tandt, Wezembeek-Oppem, both of Belgium, assignors to PB Gelatines, Brussels, Belgium

Filed Jan. 10, 1973, Ser. No. 322,422

Claims priority, application France, Jan. 10, 1972, 72.00582

Int. Cl.² A23L *1/04*

U.S. Cl. 426—576 **14 Claims**

1. A cold-water-soluble gelatin composition consisting essentially of:

a. a particulate, spray dried, tunnel dried or drum dried amorphous gelatin component having particle size not exceeding 210 microns, said amorphous gelatin component having been prepared by evaporation of a gelatin solution without passing through the gelled state, then ground and screened, and

b. a powdered, water-dispersible comestible component different from (a) and having the following particle size:

i. not exceeding 500 microns, and

ii. at least one part by weight of said comestible component per part by weight of gelatin in said composition having a particle size not exceeding the particle size of the gelatin component;

the proportion of (b) to (a) in the composition being sufficient to maintain the gelatin in the non-clumping form when the composition is dispersed in water having a temperature of 15°–25°C.

3,930,053

RAPIDLY DISSOLVING DRY BEVERAGE MIX

Cornelis Hendrikus Japikse, Springfield Township, Hamilton County; Gyanendra Singh, Fairfield, and Timothy J. Kennedy, Springfield Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 17, 1974, Ser. No. 489,278

Int. Cl.² A23L *2/00*

U.S. Cl. 426—590 **6 Claims**

1. A process for preparing a rapidly dissolvable and substantially dry beverage flavor mix comprising:

a. forming a slurry by admixing a flavor base with sugar crystals in an amount such that said admixture has a flavor base: sugar ratio of about 0.03 to about 0.15 and said slurry admixture has a total solids concentration of from about 75 to about 95 percent;

b. drying said slurry admixture to substantial dryness in a manner in which to form a stable foam; and

c. grinding said stable foam to form discrete dry beverage flavor particles.

3,930,054

METHOD OF MAKING IMPROVED DRIED EGG PRODUCT

Roger Liot, and Evelyne Liot, both of 134 Avenue Laferriere, Creteil, France

Continuation of Ser. No. 306,415, Nov. 14, 1972, abandoned, which is a continuation of Ser. No. 68,489, Aug. 31, 1970, abandoned. This application Apr. 12, 1974, Ser. No. 460,557

Claims priority, application France, Oct. 21, 1969, 69.36084

Int. Cl.² A23B *4/04*

U.S. Cl. 426—614 **13 Claims**

1. A method of preparing a dried egg product that rehydrates easily without forming lumps which comprises the steps of combining a liquid egg with the reaction products resulting from the transesterification of natural triglycerides of animal or vegetable origin with saccharose and drying said egg composition to form a powder.

3,930,055

VERY LOW CARBOHYDRATE BAKED PRODUCT

Elaine Green Engelman, 938 Berkeley Ave., and Dorothy Neri, 328 Hillcrest Ave., both of Trenton, N.J. 08618

Continuation-in-part of Ser. No. 258,268, May 31, 1972, abandoned. This application Nov. 16, 1973, Ser. No. 416,407

Int. Cl.² A21D *13/04*, *13/06*; A23J *3/00*

U.S. Cl. 426—644 8 Claims

1. A very low carbohydrate baked product made from dough, said dough consisting principally of proteinaceous powder having less than 10% carbohydrate and leavening agent.

3,930,056

USE OF MODIFIED DRIED WHEY AS A FLAVOR ENHANCER IN FOODS

Joseph Vincent Feminella, Excelsior, Minn.; Nicholas Melachouris, Hartsdale, and Robert M. Lauck, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 336,844, Feb. 28, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,579

Int. Cl.² A23C *21/00*

U.S. Cl. 426—646 6 Claims

1. A method of enhancing the flavor of food which comprises adding to said food in an amount effective to enhance the flavor of said food a modified dried whey derived by drying the low protein-high ash fraction obtained by the molecular sieve fractionation of partially delactosed whey and having the following general composition: Lactose, about 35–45 percent, Ash, about 20–30 percent, Protein about 15–20 percent, Lactate, about 8 percent, Citrate, about 5 percent, moisture, about 2 percent, Fat, about 0.1 percent.

3,930,057

HIGH CALORIE PUDDING

Louis Jokay, Niles, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 20, 1975, Ser. No. 560,306

Int. Cl.² A23L *1/187*, *1/04*

U.S. Cl. 426—577 9 Claims

1. A high calorie pudding substantially devoid of sodium, potassium and protein comprising:

a. 40–60 percent of a 3–10 percent fruit pectin in water solution,

b. 20–30 percent sucrose, dextrose, or mixtures thereof, and c. about 20–30 percent of edible vegetable oils which are normally liquid above 75°F. and have a polyunsaturate/saturate ratio of about 2/1.

3,930,058

MODIFIED VEGETABLE PROTEIN SIMULATING CASEIN

Surinder Kumar, 3 Villa Verde Drive, Apt. 103, Buffalo Grove, Ill. 60090, and Kolar S. Ramachandran, 1465 Joan Drive, Palatine, Ill. 60067

Filed June 12, 1974, Ser. No. 478,757

Int. Cl.² A23J *3/00*, *3/02*

U.S. Cl. 426—656 8 Claims

1. A process for producing a modified vegetable protein having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

A. making an aqueous slurry of a vegetable protein material containing at least about 50 percent by weight protein selected form the group consisting of oat protein and oil seed vegetable protein, said slurry having a solids content of from about 3 percent to about 16 percent by weight;

B. adjusting the pH of the aqueous slurry to a pH of from above 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

C. heating the aqueous slurry to a temperature of from 280°F. to 370°F. for from 2½ to 5 minutes to react the alkali metal carbonate with the protein;

D. neutralizing the slurry to a pH of from 6.6 to 7.0 by addition thereto of an edible acid; and

E. drying the neutralized slurry to remove a substantial portion of the water therein.

3,930,059

DENTAL FLOSS ROLL COMPRISING INTERCONNECTED PIECES EACH HAVING A PICK END

Richard L. Wells, 4503 N. 32nd St., Phoenix, Ariz. 85018

Continuation of Ser. No. 368,615, June 1, 1973, abandoned, which is a division of Ser. No. 301,963, Oct. 30, 1972, Pat. No. 3,744,499. This application Mar. 14, 1974, Ser. No. 451,011

Int. Cl.² B21F *43/00*

U.S. Cl. 427—2 7 Claims

1. A method of forming a continuous arrangement of dental floss articles comprising the steps of:

forming a continuous roll of dental floss, and periodically rigidying said floss to render predetermined portions of the floss more rigid than the remainder of the floss,

said roll being coated at predetermined areas with plastic to form pick ends when the rigidified portion and a contiguous portion of floss is detached from the roll.

3,930,060

METHOD FOR FORMING A CARBIDE LAYER OF A V-A GROUP ELEMENT OF THE PERIODIC TABLE ON THE SURFACE OF AN IRON, FERROUS ALLOY OR CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoake; Tohru Arai, Nagoya; Yoshihiko Sugimoto, Nagoya, and Masayoshi Mizutani, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Apr. 27, 1973, Ser. No. 355,278

Claims priority, application Japan, May 4, 1972, 47-43730; Apr. 12, 1973, 48-40822

Int. Cl.² C23C *9/10*; C23F *7/00*

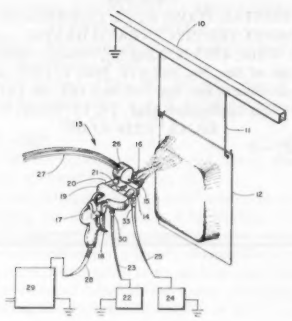
U.S. Cl. 427—12 13 Claims

1. In a method for forming a carbide layer on an iron, ferrous alloy, or cemented carbide article, said articles containing at least 0.05% by weight of carbon, which comprises preparing a molten treating bath consisting essentially of boric acid or a borate and a metallic element dissolved therein, said metallic element being selected from the group consisting of vanadium, niobium and tantalum; immersing said article into said molten treating bath; maintaining said article in said molten treating bath to form a carbide layer of said metallic element on the surface of said article, and removing said article from the molten treating bath; the improvement wherein said molten treating bath is prepared by the method which comprises heating a boric acid or a borate to its molten state to form a molten bath; dipping a metal block containing at least one element selected from the group consisting of vanadium, niobium and tantalum, and applying an electric current to the molten bath through said metal block as the anode and an electric conductive material, which is in contact with the molten bath as the cathode, to anodically dissolve said metal block.

3,930,061
ELECTROSTATIC METHOD FOR FORMING STRUCTURES AND ARTICLES

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Apr. 8, 1974, Ser. No. 459,059
Int. Cl.² B05D 1/06
U.S. Cl. 427—27 13 Claims



1. A method of forming a structure from plural component material with electrostatic deposition comprising

forming a promoted resinous material into a spray at one site;

establishing an electrostatic field from a charging electrode adjacent the site of formation of the spray of resinous material to charge the spray with one polarity;

simultaneously forming a catalyst material for said resinous material into a spray at another and grounded site adjacent the charging electrode, and charging said catalyst spray to the opposite polarity from said promoted resin, the site of formation of the spray of catalyst material acting as a terminous of the electrostatic field from said charging electrode; and

projecting the sprays from said sites of formation so that they converge and mix, the volume of said sprayed resin being greater than that of said catalyst material whereby said spray of mixed promoted resin and catalyst retains a net charge of said one polarity, and are directed for electrostatic deposition on a surface maintained at a spray-attracting potential on which the structure is to be formed.

3,930,062
COMPOSITION AND METHOD FOR ELECTROSTATIC DEPOSITION OF DRY PORCELAIN ENAMEL FRIT

Arsenije I. Nedeljkovic, Oak Park, Ill., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Dec. 4, 1974, Ser. No. 529,402
Int. Cl.² B05D 1/06; C03C 5/02
U.S. Cl. 427—27 15 Claims

1. The method of electrostatically spraying a porcelain enamel frit which comprises reacting said frit with an alkoxysilane having the formula:

$$R_n\text{-Si-}(OCH_3)_{4-n}$$

where R is a methyl or phenyl group or combinations of these and n is 1 or 2, and thereafter electrostatically spraying the reacted frit onto a substrate.

13. A composition for deposition by electrostatic spraying comprising a particulate porcelain enamel frit combined with a caking reducing amount of an alkoxysilane having the formula:

$$R_n\text{-Si-}(OCH_3)_{4-n}$$

where R is a methyl or phenyl group or combinations of these and n is 1 or 2.

3,930,063
CORRECTING FOR NON-UNIFORMITY OF A SILICA SOL COATING

Richard C. Miller, and Charles C. Payne, both of Chicago, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 23, 1973, Ser. No. 390,897
Int. Cl.² B05D 3/06; B05B 5/00; D06L 3/12
U.S. Cl. 427—54 2 Claims

1. A method of determining the uniformity of application of a coating on a substrate and correcting for lack of uniformity comprising:

preparing an aqueous coating mixture containing an aqueous silica sol;

incorporating in said coating mixture a fluorescent dye which becomes visible when irradiated with radiant energy of a predetermined wave length;

applying said coating mixture including said fluorescent dye to a substrate by means of an applicator;

radiating the applied coating on the substrate while it is still wet with radiant energy of said predetermined wave length to render the fluorescent dye visible to denote the uniformity or lack of uniformity of the application; and

adjusting the applicator to correct for non-uniformity of coating application.

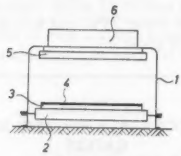
3,930,064
METHOD FOR CURING A COATING ON A BASE

Conrad Sander, Panoramastrasse 55, 7441 Zizishausen, Germany

Continuation-in-part of Ser. No. 407,652, Oct. 18, 1973, abandoned, which is a continuation of Ser. No. 135,009, April 19, 1971, abandoned. This application Nov. 5, 1974, Ser. No. 455,946

Claims priority, application Germany, Apr. 22, 1970, 2019270

Int. Cl.² B05D 3/06
U.S. Cl. 427—54 5 Claims



1. A method of curing and hardening a coating on a base, said coating comprising an organic material which reacts exothermically with oxygen after being energized by being exposed to ultraviolet light, containing an ethylenically unsaturated double bond, which method comprises exposing said coating to a plurality of flashes of ultraviolet light to initiate a reaction in said coating, each said flash producing energy of at least 4.5 milliwatt/seconds per cm² of the surface of said coating to produce at least about 0.03% of radiation having an effective wave length of 197.4 nm, the means employed for producing said flashes being a flash lamp supplied with a current per flash having a density of more than 4000 A/cm² of

the cross section of the light arc which is produced between the electrodes in said flash lamp and an output of less than 100 watt/seconds, said flash lasting for a period of less than 50 microseconds, each of said flashes being separated from the next flash for a period of time having a length equal to more than 100 times the length of time of one of said flashes.

3,930,065

METHODS OF FABRICATING SEMICONDUCTOR DEVICES

Ian Martin Baker; John David Emrys Beynon, and Peter Christopher Tudor Roberts, all of Southampton, England, assignors to National Research Development Corporation, London, England

Filed Nov. 7, 1973, Ser. No. 413,439

Claims priority, application United Kingdom, Nov. 10, 1972, 51950/72

Int. Cl.² B44D *1/18*

U.S. Cl. 427—89 **18 Claims**

1. A method of making a charge-coupled device having an ordered array of electrodes, including the steps of:

forming a surface layer for a body of semi-conductor material, the surface layer being of material other than conducting material and having an ordered array of projections thereon, each projection being associated with one of the desired electrodes particular thereto, and

depositing conducting material permanently on the said surface, at least in a region containing the said projections, to form the said electrodes, wherein the incident material casts shadows from the projections forming gaps between the electrodes where the shadows occur, the shadowed area being essentially devoid of deposited conducting material.

8. A method of making a charge-coupled device according to claim 1 wherein the projections define a plurality of parallel grooves and the deposition of conducting material is carried out by vacuum deposition over the whole area over which the grooves extend except for those parts of the area containing the ends of the grooves, to form electrodes each of which has two contiguous portions, one portion extending over the associated projections, except on that part of the projection forming part of one of the said gaps, and the other portion extending over the surface layer between the associated projection and an adjacent portion, except where part of another of the said gaps is formed.

3,930,066

TECHNIQUE FOR FABRICATION OF FOIL ELECTRET

Francis William Ryan, Millington; Harold Schonhorn, New Providence; Gerhard Martin Sessler, Summit, and James Edward West, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 12, 1973, Ser. No. 378,580

Claims priority, application Switzerland, July 24, 1972, 10990/72

Int. Cl.² H01F *27/42*

U.S. Cl. 427—79 **6 Claims**

1. A technique for the fabrication of a foil electret which comprises the steps of

a. bombarding the surface of a perfluorinated foil with an electron beam having an energy level within the range of 2.5 to 40 keV and an intercepted charge density within the range of 10^{-8} to 10^{-5}C/cm²,

b. depositing a layer of gold on the resultant bombarded surface, and

c. charging the non-gold coated surface of said foil by bombarding the resultant assembly with a focused and scanned monoenergetic beam operating in the range of 10–40 keV for intervals ranging from 1–10 seconds in a vacuum while maintaining a current density for a time interval selected to yield a current time product within the range from $10^{8} - 2 \times 10^{-7}$ A sec/cm².

6. A technique in accordance with claim 1 wherein the resultant charged structure is heated to a temperature of the order of 140°C for about 1 hour.

3,930,067

METHOD OF PROVIDING POLYCRYSTALLINE LAYERS OF ELEMENTTARY SUBSTANCES ON SUBSTRATES

Jan Gorrissen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 90,060, Sept. 29, 1970, abandoned, which is a continuation of Ser. No. 871,592, Nov. 10, 1969, abandoned, which is a continuation of Ser. No. 630,842, April 14, 1967, abandoned. This application Oct. 18, 1972, Ser. No. 298,624

Claims priority, application Netherlands, Apr. 16, 1966, 6605144

Int. Cl.² B05D *5/12*

U.S. Cl. 427—86 **2 Claims**

1. A method of providing an even fine-granular polycrystalline silicon layer on a silicon oxide substrate comprising the steps of passing over the substrate a gas current containing a thermally decomposable hydrogen compound selected from the group consisting of alkylsilanes and butane in an excess of hydrogen while heating the substrate at the decomposition temperature of said hydrogen compound to deposit on the surface layer a dense layer containing silicon or carbon in elementary form, thereafter passing over the substrate a gas current containing silicon chloride and hydrogen while heating the substrate at the decomposition temperature of silicon chloride temperature to continue to deposit on the silicon or carbon layer a polycrystalline layer of silicon.

3,930,068

METHOD FOR SEALING LEAKS IN RIGID HOLLOW ARTICLES

Samuel Sloan, 13011 Old Stage Coach Road, Laurel, Md. 20811

Filed May 23, 1973, Ser. No. 362,883

Int. Cl.² B32B *35/00*

U.S. Cl. 427—140 **1 Claim**

1. A method of repairing a rigid, hollow article useful for containing a fluid material therein, having one or more local fluid permeable discontinuities therein, comprising spreading over each of said discontinuities and the outer surface of said hollow article immediately adjacent to said discontinuities a composition consisting essentially of 12.5 parts by weight nitrocellulose, 76.5 parts by weight of an inert solvent, 10.0 parts by weight of a natural or synthetic resin, and 3.0 parts by weight of dibutyl phthalate.

3,930,069

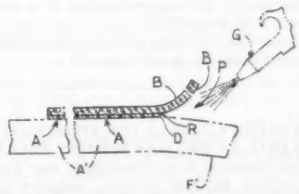
REFINISH PAINTING METHOD

Charles Edward Stephens, 10037 Dixie Highway, Anchorville, Mich. 48004

Continuation of Ser. No. 271,294, July 31, 1972, abandoned. This application June 20, 1974, Ser. No. 481,383

Int. Cl.² C09J *7/04*

U.S. Cl. 427—142 **4 Claims**



1. A method of refinish painting a panel surface which is sub-divided generally along a longitudinal demarcation zone into two surface sections, which demarcation zone coincides with a highlight of said panel surface being refinish painted, comprising applying to said panel surface a protective tape

having an adhesive coating on a portion of one side surface thereof, the application being in such manner that said surface portion adheres to one panel surface section over a substantial area and along an edge of said demarcation zone, and that another portion of said tape side surface which lacks an adhesive coating, while facing the other panel surface section, diverges outwardly and non-adherently to the latter at an acute angle thereto, said divergent uncoated portion coacting with said other panel surface section in forming a tapered outwardly opening pocket to one side of the adhered tape area and demarcation zone, the adhesive coating of said one side surface portion being such that a ramp-like portion of the adhesive coating is formed along the junction line of the adhesive-coated and adhesive-lacking tape surface portions, and applying to said other panel surface section through the outward opening of said pocket a layer of refinish paint, which layer inwardly terminates as to said other panel surface section within said pocket and ramp-like portion at said edge of said demarcation zone.

3,930,070

COATING PROCESS USING A FLUIDISABLE POWDER COMPRISING A HEAT-STABLE BISIMIDE RESIN AND PARTICLES OF GLASS OR MICA

Michel Cronenberger, Lyon; Serge Laurent, Bron, and Maurice Mallet, Lyon, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 91,610, Nov. 20, 1970, abandoned. This application Apr. 19, 1972, Ser. No. 245,670

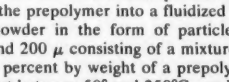
Claims priority, application France, Nov. 24, 1969, 69.40392; Oct. 1, 1970, 70.35524

Int. Cl.² B05D *1/24, 1/36, 3/00*

U.S. Cl. 427—185 **27 Claims**

1. A process for coating an article which comprises dipping the article, which is heated to a temperature above the softening point of the prepolymer into a fluidized bed containing a fluidizable powder in the form of particles of dimensions between 5 and 200 μ consisting of a mixture comprising:

a. 5 to 95 percent by weight of a prepolymer obtained by heating at between 50° and 250°C., an N,N′-bis-imide of an unsaturated dicarboxylic acid of general formula:



(I)

in which D represents a divalent radical containing a carbon-carbon double bond and A represents a divalent radical containing 2 to 30 carbon atoms, and a di-primary diamine of general formula:

$$H_2N - B - NH_2 \qquad (II)$$

in which B represents a divalent radical containing 2 to 30 carbon atoms, and

b. 95 to 5 percent by weight of particles selected from glass micro-spheres, mica particles and mixtures thereof, and subsequently stoving the coating at a temperature between 150° and 300°C.

15. A process according to claim **14,** wherein the powder has a particle size not greater than 80 μ.

3,930,071

PROCESS FOR COATING THE RUBBING SURFACES OF THE SEAL OF THE GAS TURBINE REGENERATOR

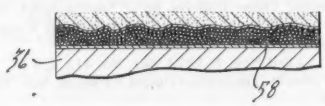
V. Durga Nageswar Rao, Woodhaven, and Yeshwant P. Telang, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1973, Ser. No. 415,897

Int. Cl.² B05D *1/36, 3/12*

U.S. Cl. 427—203 **3 Claims**

1. A method for forming a low friction seal coating on a rubbing seal surface for a ceramic regenerator core comprising the steps of mixing a polyarysulfone polymer with a graphite lubricant with a proportion of approximately 35% polymer by weight and 65% graphite by weight in a solvent, preparing a bond coating on the seal surface by applying a mixture of approximately 80% nickel by weight and 20% chromium by weight alloy powder to the surface of the seal, applying a thin coating of the polymergraphite mixture to the bond coating, drying the solvent from the polymer-graphite coating at approximately 250° to 300°F for at least 15 minutes, curing the coating at approximately 400°F to 500°F for approximately one-half hour to one hour and pressure laminating the coating at a temperature of approximately 500°F to 800°F for approximately one-half hour to one hour with a pressure of approximately 800 to 1500 psi, and slowly cooling the coating and grinding the coating to a smooth surface finish.



3,930,072

STABILIZATION OF METAL PLATING BATHS

Alan D. Wilks, Elk Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 28, 1974, Ser. No. 483,998

Int. Cl.² B05D *3/10*

U.S. Cl. 427—306 **6 Claims**

1. In the electroless deposition of copper on a substrate comprising a thermosetting resin, wherein the substrate is coated with copper in an electroless coating bath containing dissolved copper, the method of prolonging the usable life of said bath which comprises adding thereto from about 0.001 to about 1 percent by weight of a coumarin compound selected from the group consisting of coumarin, alkyl coumarins containing from 1 to about 5 carbon atoms in the alkyl group, and cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, phenyl, benzyl and tolyl orthocoumarates and from about 0.1 to about 5 percent by weight of a surfactant selected from the group consisting of alkyaryl polyether alcohols, sulfonates and sulfates and cyclic ether tetrahydric alcohols and anhydrides of sorbitol.

3,930,073

MIGRATION CONTROL RESIN COMPOSITIONS AND METHODS OF USING THE SAME ON POROUS MATERIALS

Arthur H. Dreilich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 8, 1974, Ser. No. 449,309

Int. Cl.² B44D *1/44;* **C08L** *1/28, 5/24*

U.S. Cl. 427—341 **8 Claims**

1. Stable, aqueous, colloidal synthetic resin compositions comprising: (1) from about 0.1 percent by weight to about 60 percent by weight of a colloidal synthetic resin; and (2) from about 0.01 percent by weight to about 2 percent by weight, based on the dry solids weight of the colloidal synthetic resin, of a metal ammine coordination complex of a high molecular weight, water-soluble, polymeric, polycarboxy-containing thickening resin selected from the group consisting of naturally occurring carboxylic acids, carboxy-containing cellulosics and the salts of said carboxylic acids and cellulosics, said metal being selected from the group consisting of zinc, copper, cobalt, nickel and chromium.

3,930,074
SYNTHETIC RESIN COMPOSITIONS AND METHODS OF APPLYING THE SAME TO POROUS MATERIALS TO CONTROL MIGRATION THEREON

Arthur H. Drelich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 8, 1974, Ser. No. 449,311
Int. Cl.² B05D *7/00*; **C08L** *1/28*
U.S. Cl. 427—341 **14 Claims**

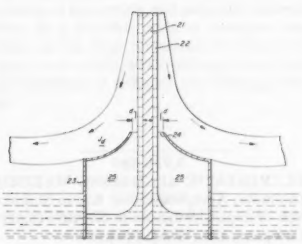
1. Stable, aqueous, colloidal synthetic resin compositions having an alkaline pH comprising: (1) from about 0.1 percent by weight to about 60 percent by weight of a colloidal synthetic resin; and (2) from about 0.01 percent by weight to about 2 percent by weight, based on the dry solids weight of the collodial synthetic resin, of a reaction product of a zirconyl complex salt and a high molecular weight, water-soluble, polymeric, polycarboxy-containing thickening resin, said zirconyl complex salt having the formula $R_3ZrOR'A_3$, wherein R and R′ are members of the group consisting of ammonium, hydrogen, and alkali metals and A is a divalent anion.

8. A method of applying a stable, aqueous, colloidal synthetic resin composition to porous materials and controlling its migration thereon which comprises applying to porous materials a stable, aqueous, colloidal synthetic resin composition having an alkaline pH comprising: (1) from about 0.1 percent by weight to about 60 percent by weight of a colloidal synthetic resin; and (2) from about 0.01 percent by weight to about 2 percent by weight, based on the dry solids weight of the colloidal synthetic resin of a reaction product of a zirconyl complex salt and a high molecular weight, water-soluble polymeric, polycarboxy-containing thickening resin, said zirconyl complex salt having the formula $R_3ZrOR'A_3$, wherein R and R′ are members of the group consisting of ammonium, hydrogen, and alkali metals and A is a divalent anion; and substantially immediately diluting the synthetic resin composition to substantially immediately coagulate and precipitate the synthetic resin composition.

3,930,075
METHOD FOR CONTROLLING SPLASHING RESULTING FROM THE USE OF GAS KNIVES

Henry F. Myers, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 26, 1973, Ser. No. 428,468
Int. Cl.² B05D *1/18*
U.S. Cl. 427—349 **9 Claims**



1. In the method for the continuous hot-dip coating of a metal strip, wherein the strip emerges from a liquid bath in a generally upward direction and the thickness of the liquid layer adhering to said emerging strip is controlled by gas jets impinging against the planar surfaces of said strip at an angle of about 0° to 30° below the horizontal, said impingement causing each of said jets to divide into component streams, which components include wall streams flowing downward on both planar strip surfaces, said downward wall streams causing undesirable turbulence of the liquid bath within a region proximate the metal strip;

the improvement for minimizing said liquid bath turbulence which comprises; employing a baffle chamber, the sides of which are substantially enclosed to form a restricted outlet for said downward wall streams, the bottom portions of said sides being approximal to the surface of the liquid bath, whereby the surface of the liquid bath serves as the bottom enclosure for said chamber to substantially restrict the egress of said wall streams; the topmost portion of said chamber lying an effective distance below the point at which said gas jet impinges upon the planar strip surfaces, said topmost portion having a generally rectangular slot opening, the long edges of which are substantially parallel to the planar faces of said strip, said slot opening being of a dimension at least sufficient to permit the unencumbered passage of said strip therethrough, but in which the normal distance between a planar surface of said strip and the oppositely facing long edge of said slot is no greater than about four times the thickness of the wall stream passing therebetween, whereby the resultant restricted wall streams within the chamber form a back pressure therein, sufficient to provide an air cushion to baffle the downcoming wall streams.

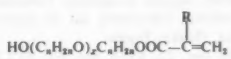
3,930,076
METHOD FOR PROVIDING DENTURES WITH A SOFT HYDROGEL LAYER

Karel Kliment, 321 Walnut Lane, Princeton, N.J. 08540

Filed July 13, 1973, Ser. No. 378,933
Int. Cl.² A61C *13/28*; **C08J** *7/08*
U.S. Cl. 427—353 **29 Claims**

1. A method of providing dentures having a hard polymeric acrylic base with a soft hydrogel layer comprising the steps of: preparing a paste consisting essentially of:

1a. a liquid hydrophilic monomer of the formula



where R is H or methyl, n is 2 or 3 and x is 0 or an integer up to 4; or

1b. a mixture of (a) with a copolymerizable ethylenically unsaturated monomer, said copolymerizable monomer being present in an amount insufficient to render the polymer formed either water soluble or hydrophobic;

2. an anhydrous water soluble solvent capable of dissolving said hard polymeric acrylic base but not the soft hydrogel; and

3. a finely divided inert filler;

applying said paste to the hard polymeric acrylic base; and polymerizing said paste to form a hydrophilic polymer coating on said base.

3,930,077
FILTERS

William E. Levers, and Charles H. Keith, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 237,925, March 24, 1972, Pat. No. 3,800,676. This application Dec. 19, 1973, Ser. No. 426,166
Int. Cl.² A24B *15/02*, *15/033*; **A24C** *5/50*
U.S. Cl. 427—384 **4 Claims**

1. A process for preparing an intermediate product particularly adapted for use in tobacco smoke filters comprising providing a web of synthetic, thermoplastic filbers selected from the group consisting of polyolefin, polyamide and polyester fibers, coating at least one surface of said web with a solution of film-forming cellulose ether in a quantity sufficient to cause from about 10 to about 40 percent of said cellulosic derivative, based on the weight of said web, to remain on the web and removing solvent from the treated web to produce at least a partial film on the surface of said web.

3,930,078
COATING WITH ARYLENE SULFIDE POLYMER CONTAINING COMPOUNDS TO ENHANCE CURE

James N. Short, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 420,254, Nov. 29, 1973, Pat. No. 3,884,873. This application Dec. 4, 1974, Ser. No. 529,533
Int. Cl.[2] B05D *3/02*; B32B *15/08*
U.S. Cl. 427—388 9 Claims

1. A method of forming a coated substrate comprising: applying a coating composition comprising an arylene sulfide polymer and an amount sufficient to reduce melt flow of said polymer of a compound selected from the group consisting of tetrakis[3-(3,5-di-tert-butyl-4-hydroxypheny)propionyloxymethyl]methane, 1,3,5-trimethyl tris[3,5-di-tert-butyl-4-hydroxybenzyl]benzene, and octadecyl-3-(3′, 5′-di-tert-butyl-4′-hydroxyphenyl)propionate to a substrate; and heating said substrate for a time within the range of 10 to 40 minutes at a temperature within the range of 575°–725°F.

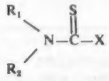
3,930,079
METHOD FOR FIRE-PROOFING TREATMENT OF FABRICS COMPOSED OF POLYESTER AND CELLULOSIC FILAMENTS OR FIBERS

Astuo Hashizume, Kyoto; Ryuichiro Tsuzuki, Ibaraki, and Haruo Mizushima, Takatsuki, all of Japan, assignors to Teijin Limited, Osaka, Japan

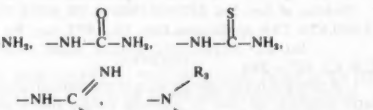
Filed Dec. 12, 1974, Ser. No. 532,239
Claims priority, application Japan, Dec. 12, 1973, 48-137679
Int. Cl.[2] D06M *13/28*; C09K *3/28*
U.S. Cl. 427—396 6 Claims

1. A method for fire-proofing treatment of a fabric composed of polyester and cellulosic filaments of fabers, which comprises impregnating said fabric with the following treating agents (1) to (5)

1. a tetrakis-hydroxymethyl phosphonium compound,
2. methylolmelamine,
3. a thiocarbamic acid derivative expressed by the following formula

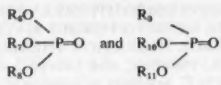


wherein X is a group selected from the class consisting of



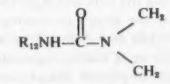
and —OR_3, each of R_1, R_2, R_3, R_4 and R_5 is a hydrogen atom or a hydrocarbon group containing 1 to 12 carbon atoms, and R_1 or R_2 may, together with X, form a cyclic structure,

4. an organic halogenated phosphorus compound selected from the group consisting of



wherein R_6, R_7 and R_8 are the same or different, and each represent a monovalent hydrocarbon group containing 1 to 12 carbon atoms, at least one of R_6, R_7 and R_8 contains at least one halogen atom selected from the group consisting of bromine and chlorine, R_9, R_{10} and R_{11} are the same or different and each represent a monovalent hydrocarbon group containing 1 to 12 carbon atoms, and at least one of R_9, R_{10} and R_{11} contains at least one halogen atom selected from the group consisting of bromine and chlorine, and

5. a long-chain alkylethyleneurea of the formula



wherein R_{12} is a monovalent saturated alkyl group containing 8 to 22 carbon atoms,

the amounts of the treating agents (1), (2), (3), (4) and (5), when designated *a*, *b*, *c*, *d* and *e* respectively, being as follows based on the total weight of *a* to *e*

a = 40 to 80 percent
b = 10 to 50 percent
c = 5 to 25 percent
d = 3 to 10 percent
e = 1 to 5 percent

and satisfying the following equation

$$4 \quad \frac{100\,(d\% + e\%)}{a\% + b\% + c\%} \quad 15$$

and heat-setting the impregnated fabric.

3,930,080
ELECTROSTATIC RECORDING MATERIALS

Tadashi Tanimoto, Amagasaki, and Kazuo Shibata, Nishinomiya, both of Japan, assignors to Kanzaki Paper Manufacturing Company, Ltd., Tokyo, Japan

Filed Mar. 19, 1974, Ser. No. 452,642
Claims priority, application Japan, Mar. 20, 1973, 48-32025
Int. Cl.[2] B32B *9/04*, *21/04*
U.S. Cl. 427—411 10 Claims

1. In an electrostatic recording material consisting essentially of an electroconductive base sheet having a dielectric layer on which a negatively charged electrostatic image of electrical signal is to be formed, an improvement which is characterized in that said dielectric layer contains at least one of guanidine compounds selected from the group consisting of guanidine, guanidine derivatives, and salts thereof in a proportion of 0.05 to 20 weight percent.

3,930,081

COMPOSITION AND PROCESS FOR DISPLACEMENT PLATING OF ZINC SURFACES

Hiroshi Shinomiya, Yokohama; Kajuro Muro, Komae; Sumio Sakata, Kobe; Shigeki Saida, Tokyo; Seichiro Umehara, Tokyo; Yutaka Tsuchiya, Tokyo; Kunijo Yashiro, and Yoshio Moriya, both of Yokohama, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Nov. 2, 1973, Ser. No. 412,120

Claims priority, application Japan, Nov. 6, 1972, 47-110257; Jan. 11, 1973, 48-5519

Int. Cl.² C23C *3/00*

U.S. Cl. 427—421 2 Claims

1. A process for providing a paint base coating on a zinc or zinc alloy surface, comprising contacting said surface with an aqueous acidic composition suitable for the displacement plating of a zinc or zinc alloy surface, consisting essentially of a. a soluble heavy metal compound selected from the group consisting of nickel, cobalt and iron in an amount of 0.1 – 50 g/l expressed as the heavy metal; and

b. a soluble compound of a desensitizing metal selected from the group consisting of antimony, tin, copper, lead, germanium, vanadium, arsenic and tungsten in an amount of at least 0.001 g/l expressed as the metal.

3,930,082

BOOKBINDING TAPE

Gunther J. Waldeck, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

Continuation of Ser. No. 151,863, June 10, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 452,194

Int. Cl.² D03D *11/0*

U.S. Cl. 428—255 1 Claim

1. A prefabricated bookbinding tape having a substrate in the form of a film having a thickness within the range of 0.5 to 10 mils formed of a high melting point, high heat transfer value, tough, flexible and scuff resistant high polymeric material, a low temperature heat-reactivatable adhesive layer having a thickness within the range of 7 to 25 mils on one side of the substrate and a non-tacky layer as an overlayer laminated on the adhesive layer to prevent blocking of the adhesive layer, said non-tacky layer being a thin open net fabric through which the adhesive from the adhesive layer can flow when heated to activation temperature, said fabric being formed to contain synthetic resinous fibers selected from the group consisting of polyamide and polyester resins and which are reducible to a flowable state at elevated temperatures corresponding to the heat reactivatable temperature of the adhesive layer, and which when reduced to a flowable state can lend adhesiveness to enhance the binding characteristics of the tape.

3,930,083

KEYBOARD PANEL FOR AN ELECTRIC SWITCH CONTACT

Philip C. Pinkham, Arleta, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed July 26, 1974, Ser. No. 492,170

Int. Cl.² B32B *3/10*; B29D *3/00*; H01H *1/06*

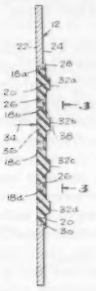
U.S. Cl. 428—67 9 Claims

1. A keyboard panel comprising:

a. rigid means having a plurality of apertures and further having first and second spaced-apart surfaces,

b. a lip flange extending from said rigid means radially inwardly into each of said apertures,

c. flexible means carried by said rigid means filling each of said apertures substantially flush with said first surface and covering a selected portion of said second surface, said aperture lip flange retaining said flexible means to said rigid means at each of said apertures, and



d. force transmitting and concentrating means extending from said flexible means at each of said apertures.

3,930,084

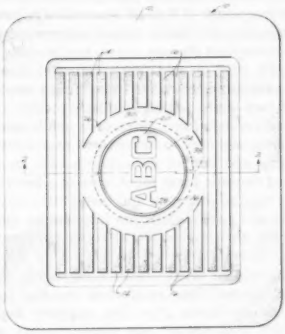
PLASTIC DECORATIVE INLAY IN A FLOOR MAT

Ronald F. Shields, Palos Verdes Estates, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Oct. 21, 1974, Ser. No. 516,387

Int. Cl.² B32B *1/04*, *3/10*; B29D *3/00*; E04C *5/04*

U.S. Cl. 428—67 16 Claims



1. An article of manufacture comprising a rubber base having a top surface, a flexible and foldable plastic inlay having a decorative surface, and means for securing the inlay to the rubber base in a releasable, interlocking fit in a fixed position relative to the base with the decorative surface of the inlay being displayed in the top surface of the base, the securing means including a raised section formed in the top surface of the rubber base, a recess formed in the raised section of the base, and a peripheral undercut below the top surface of the base for releasably holding an outer edge portion of the plastic inlay under a projecting portion of the base which overlaps the undercut.

3,930,085

PREPARATION OF THERMAL BARRIERS

Walter T. Pasiuk, Tulsa, Okla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1975, Ser. No. 549,574
Int. Cl.² B29C *17/00;* B32B *3/12*
U.S. Cl. 428—116 5 Claims

1. A method for preparation of thermal barriers that employ either a honeycomb core having a predetermined cell size with the honeycomb core being constructed of a reinforced plastic selected from glass-phenolic, glass-polyimide, and nylon-phenolic; or a fiber reinforced ceramic foam block core, said fiber reinforced ceramic foam block core formed by molding and curing a ceramic slurry formulation composed of 50 percent by weight of a laminate ceramic powder containing 77.3 percent by weight zircon and 22.7 percent by weight silica, 42 percent by weight of sodium silicate liquid, and 8 percent by weight of alumina-silica ceramic reinforcing fibers, said alumina-silica ceramic reinforcing fibers having a diameter of about 2.8 microns and having random lengths that are retained on 30 mesh size screen, said fibers being prepared for use by mixing for about 3 hours with a water/toluene solution containing 9 parts water and 1 part toluene, followed by decanting the solution, and drying the fibers in air circulating oven at 400°F until dry, said curing of ceramic slurry formulation being accomplished by air curing 16 hours at room temperature, 3 hours at 150°F, 2 hours at 250°F, 2 hours at 350°F, 2 hours at 400°F, said method for preparation of thermal barriers comprising:

i. providing said honeycomb core or said fiber reinforced ceramic foam block core and preparing the surface thereof by cleaning and etching which is accomplished by cleaning and etching in hot 5 percent sodium hydroxide solution of about 200°F and followed by washing with distilled or deionized water;

ii. dipping said honeycomb core or said fiber reinforced ceramic foam block core in a ceramic mix slurry composed of 80 parts by weight of casting mixed oxide ceramic containing 90 percent zircon and 10 silica, 15 parts by weight of sodium silicate liquid, and sufficient quantity of water in amount of 5 parts or more to adjust viscosity of ceramic mix to enable a thin uniform coating to be applied during said dipping, repeat said dipping while said honeycomb core or said film reinforced ceramic foam block core is turned over 180° to achieve complete coverage, and then while holding said honeycomb core or said reinforced ceramic foam block core in a horizontal position, tapping said core to remove any excess ceramic mix;

iii. placing said coated honeycomb core or said fiber reinforced ceramic foam block core in a horizontal position or a rigid drying rack and turn 180° every few minutes until said ceramic mix hardens and no more flow is evident and then air drying at room temperature for a minimum of 16 hours;

iv. clamping said air dried, coated honeycomb core or said air dried, coated fiber reinforced ceramic foam block core to drying forms after first applying high heat of 400°–500°F with hot air gun rapidly to any area to be shaped, and then placing said drying form with said clamped, air dried, coated honeycomb core or said clamped, air dried, coated fiber reinforced ceramic foam block core in a hot air circulating oven and curing for 2 hours at 150°F, 2 hours at 250°F, 2 hours at 350°F, and 4 hours at 400°F, and allowing to cool to room temperature;

v. completing a laminating procedure for the top surface to form a front facesheet for said cured, coated honeycomb core or said cured, coated fiber reinforced ceramic foam block core by first wetting the top surface with said ceramic mix slurry, and then applying said ceramic mix slurry to each surface of a quartz fabric and rubbing the slurry into said quartz fabric to impregnate said quartz fabric with said slurry and then wiping the excess slurry off, and subsequently, laying a first ply of the impregnated quartz fabric on the top surface of said cured. coated, honeycomb core or said cured, coated, fiber reinforced ceramic foam block core, and repeating said laminating procedure until at least four piles of impregnated quartz fabric are laid onto form an uncured front facesheet on the thermal barrier assembly;

vi. preparing said thermal barrier assembly for vacuum bag molding and curing said thermal barrier assembly under vacuum for 16 hours at room temperature, then in a hot air circulating oven for 3 hours at 150°F, 2 hours at 250°F, 2 hours at 350°F, 2 hours at 400°F, and then allowing said thermal barrier assembly to cool to room temperature and then removing the thermal barrier assembly; and thereafter,

vii. providing a back facesheet for the rear surface of said thermal barrier assembly which comprises attaching a glass-polyimide laminate to said rear surface with an adhesive selected from a polyimide-film adhesive and a ceramic adhesive.

3,930,086

APERTURED NONWOVEN FABRICS

Carlyle Harmon, Provo, Utah, assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 326,715, Jan. 26, 1973, abandoned, which is a division of Ser. No. 104,174, Jan. 5, 1971, Pat. No. 3,741,724. This application June 12, 1974, Ser. No. 478,668
Int. Cl.² B32B *3/10;* D02G *1/10*
U.S. Cl. 428—131 3 Claims

1. Apertured nonwoven textile fabrics having a predetermined pattern of fabric apertures and fiber bundles created by applied fluid forces comprising crimped, heat-insensitive, water-insoluble polyvinyl alcohol fibers having from about six to about 16 crimps per inch, a wet softening temperature of at least about 110°C., a dry heat softening temperature of at least about 210°C., and an average degree of acetalization of from about 20 mol % to about 35 mol %.

3. An infusion bag adapted to be used in the presence of boiling water and associated steam at a temperature of 100°C. and slightly higher prepared from the apertured nonwoven textile fabric defined in claim 1.

3,930,087

CREASE RESISTANT CELLULOSIC TEXTILE MATERIAL

Harro Petersen, Frankenthal; Klaus Erhardt, Ludwigshafen; Wilhelm Ruemens; Heinz Bille, both of Limburgerhof, and Güenter Reuss, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

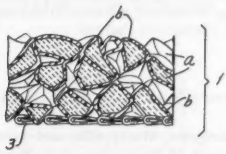
Filed Dec. 13, 1972, Ser. No. 314,800
Claims priority, application Germany, Dec. 22, 1971, 2163853
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² D06M *13/00*
U.S. Cl. 428—278 1 Claim

1. A cellulosic textile material which has been impregnated with an agent for imparting crease resist to said textile material, said agent comprising an amino resin prepared by reacting 1 mole of urea with from 3 to 10 moles of formaldehyde in aqueous solution at a pH of from 3 to 0, neutralizing said solution to a pH of from 6 to 7.5 and at a temperature of from 20° to 70°C adding urea and glyoxal in such amounts that the resulting total molar ratio of urea:formaldehyde:glyoxal is 1:1.5 to 2.5:0.1 to 0.5, said resin having been cured in the presence of an acid or potentially acid catalyst at a temperature of from 100° to 210°C.

3,930,088
DECORATIVE MATERIAL

Gurgui N. Constantin; Vasile Luca; Andras Eckardt, and Paraschiv I. Ciulacu, all of Bucharest, Romania, assignors to Intreprinderea "Bucuresti" Pentru Extragerea, Prelucrarea si Montarea Marmurei si Pietrei de Constructii, Bucharest, Romania

Division of Ser. No. 791,405, Jan. 15, 1969, Pat. No. 3,705,830. This application Jan. 27, 1972, Ser. No. 221,467
Claims priority, application Romania, Jan. 20, 1968, 55669
Int. Cl.² B32B *5/16, 19/04*
U.S. Cl. 428—143 **5 Claims**



1. A flexible-foil material for the finishing and decoration of the surface of a building and applicable to a component thereof as an intact veneer, said material comprising a net web of yarn; a plurality of layers of crystalline split stone granules overlying said web with the granules of the least undermost layer penetrating into openings of said web, said layers including an outer layer of irregular granules and being so disposed as to prevent observation of said web from the side of the foil opposite that at which said web is provided; and a binder composed of a colorless synthetic resin selected from the group which consists of acrylic, vinylic and polyester resins coating the granules of said layers exclusively in the form of a thin film and bonding the granules together and to the web without filling of the voids between said granules and between the granules and the web whereby said films are invisible from said side of said foil, said web being composed of natural or artificial textile yarn, glass yarn or coated-metal wire with said web having an open area of at least 70% of its total area, said web having a mesh size being at most 80% of the smallest particle size of the granules, said web being primed with a thermoplastic synthetic resin including finely ground filler of the material of said granules; said granules being hard stone in a particle size range of 0.5 to 5 mm, 1.5 to 3 layers of granules being provided on the web, and an adhesive mortar bonding said foil to said surface of said component and penetrating through the web contacting said corners of said granules.

3,930,089
PROCESSES FOR MAKING COMPOSITE RICE HULL-RESIN ARTICLES, PRODUCTS THEREOF, PROCESSES FOR MAKING RESIN-COATED RICE HULLS AND PRODUCTS THEREOF

Ramesh C. Vasishth, Delta, Canada, assignor to Cor Tech Research Limited, Richmond, Canada

Division of Ser. No. 314,973, Dec. 14, 1972, Pat. No. 3,850,677. This application Apr. 5, 1974, Ser. No. 458,220
Int. Cl.² B32B *5/16*
U.S. Cl. 428—212 **43 Claims**

1. A process for making a composite article which comprises the steps of

a. providing a composite mass comprising rice hulls to which has been applied a substantially water immiscible, caustic-free, thermosetting phenol formaldehyde resin, said resin being of a type that in its uncured state has a viscosity above 100 Krebb units at 120°F and

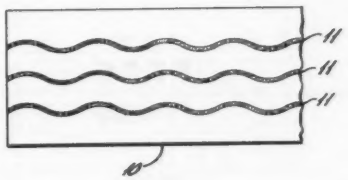
b. curing said resin of said mass, thereby forming a composite rice hull-resin article.

36. A composite article of manufacture comprising rice hulls in a binder of cured, caustic-free, thermosetting phenol formaldehyde resin, said resin being of a type that in its uncured state has a viscosity above 100 Krebb units at 120°F and which, when applied to said rice hulls, is substantially water immiscible.

3,930,090
NON-SLIP WAISTBAND PRODUCT

Roger G. Campbell, Sr.; Richard E. Goff, Jr., both of Barrington, and Thomas L. Staffier, Pawtucket, all of R.I., assignors to Johnson & Johnson, New Brunsiwck, N.J.

Division of Ser. No. 309,382, Nov. 24, 1972, Pat. No. 3,854,978. This application June 28, 1974, Ser. No. 484,192
Int. Cl.² B32B *3/10*
U.S. Cl. 428—196 **3 Claims**

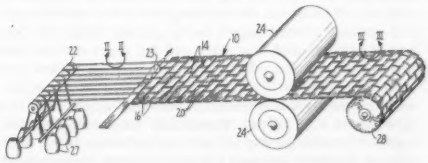


1. A new waistband product comprising; a permeable base fabric having a pattern of an elastomeric silicone compound adhered to one surface thereof, said silicone compound being flexible at temperatures of from −30°F. to +250°F., having a Shore-A hardness of from 20 to 45, a tensile strength of from 250 psi to 500 psi, a percent elongation of from 100 to 500 percent and a linear shrinkage of less than 2 percent whereby the product is dry cleanable, washable, color fast, and has good frictional characteristics.

3,930,091
UNIDIRECTIONAL WEBBING MATERIAL

Albert Lewis, Covina, and Ronald G. Krueger, Azusa, both of Calif., assignors to Kaiser Glass Fiber Corporation, Oakland, Calif.

Division of Ser. No. 288,793, Sept. 13, 1972. This application Jan. 28, 1974, Ser. No. 436,899
Int. Cl.² B32B *17/10*
U.S. Cl. 428—198 **6 Claims**

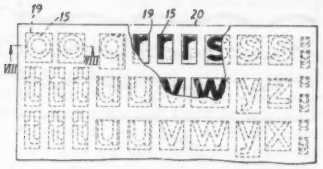


1. A unidirectional distortion resistant and relatively pliant glass fiber webbing material having a low warp to fill weight ratio, said material being comprised of a plurality of multi-filament synthetic fiber warp strands spaced from one another by about one-half inch and coated with a uniform blockable coating having a thickness of 0.002 to 0.004 inches, said coating being thermoplastic and selected from the group consisting of vinyl chloride, vinyl acetate and vinyl pyrrolidene polymers; and a plurality of glass fiber fill elements woven in intersecting crosswise relationship to said warp strands in a fill to warp weight ratio of 90% or more, said fill elements comprising weft bundles of glass fiber rovings composed of uncoated fine glass fiber fill elements and being bonded to said warp strands at their areas of intersection through the blockable coating on the warp strands.

3,930,092
PRINTING CHARACTERS FOR USE IN TRANSFER PRINTING PROCESSES

Alec Shapiro, London, England, assignor to Adhesive Materials Limited, London, England

Continuation-in-part of Ser. No. 74,301, Sept. 22, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,878
Claims priority, application United Kingdom, Sept. 24, 1969, 47117/69
Int. Cl.² B32B *3/00*
U.S. Cl. 428—204 **2 Claims**



1. For use in a transfer printing process in which printing characters formed on one support surface are transferred individually from that surface to another support surface, comprising a translucent sheet, a first printed layer on the sheet of a first marking material, said layer consisting of printing characters, a second printed layer on the sheet of a second marking material consisting of rectangular printed areas sandwiching respective printing characters of the first layer between the sheet and said second layer and an additional layer of pressure sensitive adhesive which sandwiches between itself and the sheet the layers of the first and second marking materials, each character of the first layer being located in relation to the associated rectangular area of the second layer in the same known relationship with respect to said area as the same character of solid type mounted on the platform of a type body used in a type setting process bears with respect to the area of said platform, the bonding forces between the said first and second printed layers being greater than the bonding forces between said first layer and the sheet and the bonding forces between the additional layer and the second printed layer being greater than the bonding forces between the second printed layer and the sheet, whereby application of pressure to the side of the translucent sheet remote from said layers of marking material and said adhesive layer when the sheet is disposed with said layers of marking material and said adhesive layer facing a further support surface to which said additional layer of pressure sensitive adhesive can be bonded, effects transfer to the further support surface of the first and second layers forming respectively the printing character and the rectangular area within which the printing character is located so that after transfer of a first printing character and its associated rectangular area of said second layer from the sheet to the further support surface, a second printing character can be transferred to the second support surface together with its associated rectangular area of said second layer so that the rectangular areas associated with said first and said second printing characters are juxtaposed in edge to edge relationship to provide printed intelligence in which the printing characters are spaced from one another in a manner corresponding with the spacing of similar characters when printed by a type setting process.

3,930,093
BISMUTH-CONTAINING SILVER CONDUCTOR COMPOSITIONS

Oliver Alton Short, Luton, England, assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

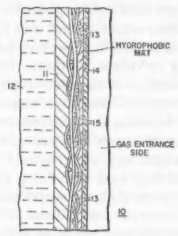
Division of Ser. No. 429,078, Dec. 28, 1973, Pat. No. 3,876,433. This application Feb. 7, 1975, Ser. No. 547,962
Int. Cl.² B32B *3/14, 15/04*
U.S. Cl. 428—208 **4 Claims**

1. A ceramic dielectric substrate having in adherent relationship therewith a conductive pattern of a composition comprising finely divided silver, inorganic binder, and bismuth, as either finely divided elemental bismuth powder or finely divided Ag/Bi coprecipitate powder, the amount of bismuth being an amount effective to increase the solder leach resistance of conductors thereof.

3,930,094
HYDROPHOBIC MATS FOR GAS DIFFUSION ELECTRODES

Ronald N. Sampson, Murrysville, and Jacob Chottiner, McKeesport, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 285,164, Aug. 31, 1972, Pat. No. 3,799,811. This application Nov. 9, 1973, Ser. No. 414,466
Int. Cl.² B32B *5/16;* **H01M** *4/06*
U.S. Cl. 428—240 **5 Claims**



1. A non-wettable, air permeable, resilient, bondable, low melt flow hydrophobic mat, said mat being capable of bonding without melt flow while retaining hydrophobic and air permeability properties, the mat having a heat and compression resistant structure comprising about 15 to about 85 percent of unmelted, pressed, interlocked, fibrillated strands, about 0.5–4000 microns long, and about 15 to about 85 percent of unmelted irregular shaped particles, about 0.05–400 microns in diameter, both the strands and particles consisting of very high molecular weight polyethylene having a weight average molecular weight between 1,750,000 and about 5,000,000 and a melt flow index of up to about 0.02; said resilient mat having an open strand matrix containing the irregular shaped particles.

3,930,095
COMPOSITE OF RUBBER BONDED TO GLASS FIBERS

Gerard E. van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed July 19, 1973, Ser. No. 380,939
Int. Cl.² B29H *9/02;* **B32B** *17/04, 25/02*
U.S. Cl. 428—251 **10 Claims**

1. A bonded composite material comprising a glass fiber reinforcing element embedded in a vulcanized rubber, said element containing from about 10 to 40% by weight (dry) based on the weight of said element of a heat cured adhesive composition comprising essentially 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol and from about 1.25 to 24 parts

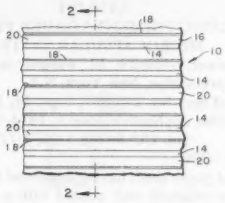
by weight of at least one water soluble thermoplastic and non-heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinol-formaldehyde novolak and said composition forming a bond between said element and said rubber, said composition coating and at least substantially totally impregnating said element.

3,930,096

COMPOSITE POROUS FABRIC-IMPERVIOUS FILM ARTICLE

Michael W. Gilpatrick, Chesnee, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 15, 1974, Ser. No. 460,983
Int. Cl.² F16K *15/00*; B32B *3/00*
U.S. Cl. 428—255 **1 Claim**



1. A novel fabric construction comprising: a first layer of porous fabric permeable material and a second layer of substantially impervious film material being heat sealed to said first layer at a plurality of elongated positions to said first layer, said layers of material being unconnected between said plurality of elongated spaced heat sealed positions, said second layer of material being severed between said heat sealed positions to provide a pair of contiguous elongated flap members.

3,930,097

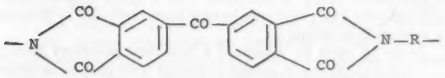
NOVEL COMPOSITIONS AND PROCESS

Louis M. Alberino, Cheshire; William J. Farrissey, Jr., Northford, and James S. Rose, Guilford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

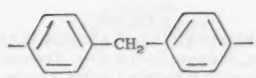
Continuation-in-part of Ser. No. 333,384, Feb. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 317,957, Dec. 26, 1972, abandoned, which is a continuation-n-part of Ser. No. 124,958, March 16, 1971, Pat. No. 3,708,458, which is a continuation-in-part of Ser. No. 75,667, Sept. 25, 1970, abandoned. This application Aug. 21, 1974, Ser. No. 499,137The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl.² C08G *20/32*
U.S. Cl. 428—260 **23 Claims**

1. A heat resistant, reinforced composite comprising, in combination,

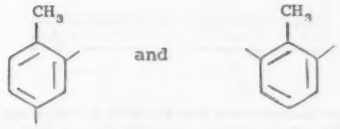
i. from about 21.5 percent by weight to about 85 percent by weight of a copolyimide consisting essentially of the recurring unit



wherein from 10 to 90 percent of said recurring units are those in which R represents



and the remainder of said units are those in which R represents a member selected from the group consisting of



and mixtures thereof; and

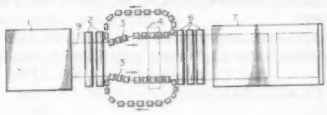
ii. from about 15 percent by weight to about 78.5 percent by weight of a reinforcing material.

3,930,098

METHOD OF MOLDING FIBER REINFORCED PLASTIC FLAT PLATES

Kunio Araki; Takashi Sasaki; Yuko Kasahara; Yoshisada Yamashita; Keiichi Yotumoto, all of Takasaki; Hiromi Sunaga, Isezaki; Kiyoshi Tabei, Fujisawa; Kazuo Goto, Takasaki; Kunio Tajiri, Tokyo, and Hirokazu Kittaka, Sagamihara, all of Japan, assignors to Nitto Boseki Co., Ltd., Fukushima and Japan Atomic Energy Research Institute, Tokyo, both of, Japan

Filed May 21, 1973, Ser. No. 362,306
Claims priority, application Japan, May 24, 1972, 47-050791
Int. Cl.² B29H *5/01*
U.S. Cl. 428—280 **17 Claims**



1. A process for continuously preparing a fiber reinforced plastic (FRP) flat plate having no warps, comprising:

covering both the top and bottom surface of a continuous FRP flat plate molding material with film-like sheetings; continuously transporting the covered material in the lengthwise direction;

irradiating the covered material as it is being transported by means of an ionizing radiation until said molding material is cured, said ionizing radiation being β-rays, electron beam, or mixtures thereof, wherein the dose rate is about 0.01 – 20 Mrad/sec with a total dose of about 0.1 – 50 Mrad;

applying tensions to the film-like sheeting covering the FRP molding material in both the lengthwise and the widthwise directions before and in the course of the irradiation, said tensions being in a degree sufficient to press and hold the molding material so as to maintain the thickness thereof uniform and the surfaces thereof smooth before and in the course of radiation; and

removing the film-like sheetings from the cured FRP molding material.

3,930,099

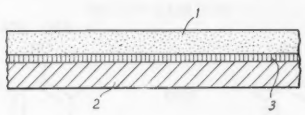
PRESSURE-SENSITIVE TRANSFER ELEMENTS

Leslie Gregson, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 22, 1974, Ser. No. 463,125

Int. Cl.² B32B *27/08, 27/30;* **B41M** *5/02*

U.S. Cl. 428—315 **13 Claims**



1. A pressure-sensitive transfer element comprising a polymeric film substrate having two surfaces; a transfer composition comprising a microporous thermoplastic polymeric sponge layer containing a pressure-releasable ink; and an intermediate anchor coating adhered to one of said surfaces and to said sponge layer to bond the transfer composition to said film substrate, wherein said anchor coating comprises a cross-linked acrylic or methacrylic acid or esters thereof resin.

8. A method of producing a pressure-sensitive transfer element comprising coating a surface of a polymeric film substrate with a solution or dispersion of a cross-linkable acrylic or methacrylic resin composition in a first volatile vehicle, heating the coated film to evaporate the first volatile vehicle from, and to effect cross-linking of, the resin composition, depositing on the cross-linked resin coating a solution or dispersion of a thermoplastic polymeric material in a second volatile vehicle, said solution or dispersion containing a pressure-releasable ink, and evaporating the second volatile vehicle to form, from the thermoplastic polymeric material, a microporous sponge layer bonded to the cross-linked coating and containing, within the pores of the sponge, the pressure-releasable ink.

3,930,100

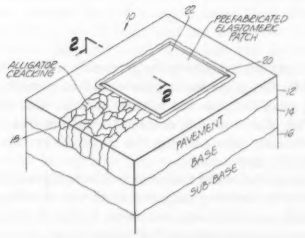
ELASTOMERIC COLD PATCH FOR PAVEMENT REPAIR

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Continuation-in-part of Ser. No. 589,190, Oct. 21, 1966, abandoned. This application July 5, 1973, Ser. No. 376,920

Int. Cl.² B32B *25/02, 25/06, 25/08*

U.S. Cl. 428—323 **17 Claims**



1. An elastomeric cold patch comprising a thin flexible backing sheet; and a layer of elastomeric pavement repair material consisting essentially of 10 through 300 penetration grade asphalt and particulate non-oil resistant asphalt soluble hydrocarbon rubber that have been mixed together in a ratio of about 2 to about 3 parts asphalt to about 1 part rubber by weight at a temperature of from 300°F to about 500°F to form a hot jellied composition from which the layer is prepared; said flexible backing sheet secured to the under side of said layer wherein the layer is impregnated with aggregate.

11. An elastomeric cold patch comprising a thin flexible backing sheet; and a layer of elastomeric pavement repair material consisting essentially of 10 through 300 penetration grade asphalt and particulate non-oil resistant asphalt soluble hydrocarbon rubber that have been mixed together in a ratio of about 2 to about 3 parts asphalt to about 1 part rubber by weight at a temperature of from 300°F to about 500°F to form a hot jellied composition from which the layer is prepared; said flexible backing sheet secured to the under side of said layer wherein the upper side of the layer has an aggregate dressing.

3,930,101

INORGANIC PIGMENT-LOADED POLYMERIC MICROCAPSULAR SYSTEM

David N. Vincent, Glenview, Ill., assignor to Champion International Corporation, New York, N.Y.

Division of Ser. No. 290,807, Sept. 21, 1972, Pat. No. 3,839,704. This application June 3, 1974, Ser. No. 475,809

Int. Cl.² B41M *5/00, 5/12*

U.S. Cl. 428—326 **21 Claims**

1. A coated paper sheet having improved opacity, said sheet comprising a cellulosic web coated with a coating composition, said coating composition comprising opacifying pigment particles consisting essentially of discrete, substantially spherical microcapsules, said microcapsules having a solid, polymeric shell and a solid, polymeric core, said polymeric core having discrete, inorganic pigment particles dispersed therein, said polymeric shell and said polymeric core being formed of different polymeric materials.

2. A record sheet which comprises a substrate having a coating on a surface thereof, which coating comprises pressure-rupturable, image-forming microcapsules and microcapsular load-bearing agents, said load-bearing agents consisting essentially of discrete, substantially spherical, non-pressure-rupturable microcapsules having a solid, polymeric shell and a solid, polymeric core. said polymeric core containing inorganic pigment particles dispersed therein, said load-bearing agents having an average diameter greater than that of said image-forming microcapsules and at least as great as the thickness of said coating.

3,930,102

ADHESIVE SHEETS AND WEBS AND PROCESS FOR THEIR MANUFACTURE

Heinz Muller, Hamburg, and Bodo Szonn, Pinneberg, both of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Filed Apr. 11, 1974, Ser. No. 460,246

Claims priority, application Germany, Apr. 19, 1973, 2320197

Int. Cl.² C09J *7/02;* **B32B** *27/40*

U.S. Cl. 428—354 **6 Claims**

1. A self-adhesive web or sheet material, which comprises a base sheet which is laminated with a polyurethane-based, self-adhesive coat, said coat having been produced by heating a mixture comprising

74 to 84 parts by weight of a branched polyether having terminal hydroxyl groups produced from propylene oxide and trimethylol propane, with a mean molecular weight of about 3000 and a hydroxyl number of about 56;

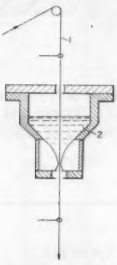
17.8 to 19 parts by weight of an aliphatic diisocyanate with an average of about 36 carbon atoms, an equivalent weight of about 300, and an isocyanate content of about 14%; and

0.3 to 0.7 parts by weight of an organometallic catalyst.

3,930,103
LIGHT TRANSMITTING FIBERS

Kazuya Chimura; Shunichi Takashima; Ryuichi Nakazono; Masao Kawashima; Hiroyuki Ota, all of Ohtake; Takashi Kaneko, Tokyo, and Kenichi Sakunaga, Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,860
Claims priority, application Japan, June 21, 1973, 48-70125
Int. Cl.² G02B *1/04, 5/16;* B32B *27/02, 27/28*
U.S. Cl. 428—361 9 Claims



1. Light transmitting fibers having core-sheath structure, which comprises a polymer mainly composed of methyl methacrylate containing at least 60 mol % of methyl methacrylate as a core component and a vinylidene fluoride-tetrafluoroethylene copolymer containing 60 to 80 mol % of vinylidene fluoride as a sheath component.

8. A method for producing light transmitting fibers which comprises composite spinning a polymer mainly composed of methyl methacrylate containing at least 60 mol % of methyl methacrylate as a core component and a vinylidene fluoride-tetrafluoroethylene copolymer containing 60 to 80 mol % of vinylidene fluoride and stretching the resultant filaments to 1.2 to 2.0 times the original length.

3,930,104
FLAME-RESISTANT POLYOLEFIN USED AS INSULATOR FOR ELECTRICAL CONDUCTORS

Burton Thornley MacKenzie, Jr., Monroe, and Edward Vincent Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,468
Int. Cl.² C08L *23/26;* H01B *3/18, 17/62*
U.S. Cl. 428—379 6 Claims

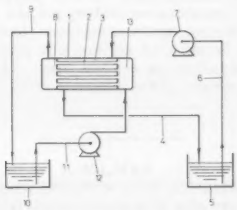
1. An insulated electrical conductor including a metallic element having thereabout an insulation of flame-resistant polyolefin compound comprising the combination of phosphorylated novolak phenol-formaldehyde and triallyl cyanurate.

2. The insulated electrical conductor of claim 1, wherein the polyolefin compound of the insulation comprises about 5 to about 10 parts by weight of phosphorylated novolak phenol-formaldehyde and about 0.5 to about 5 parts by weight of triallyl cyanurate per 100 parts by weight of the polyolefin.

3,930,105
HOLLOW FIBRES

Gilbert Christen, Lyon; Bernard Favre, Ecully; Xavier Marze, Lyon; Michel Salmon, Mions, and Rene Thuillier, Morance, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Sept. 7, 1973, Ser. No. 395,155
Claims priority, application France, Sept. 12, 1972, 72.32285
Int. Cl.² B05D *3/00;* D02G *3/22*
U.S. Cl. 428—398 8 Claims

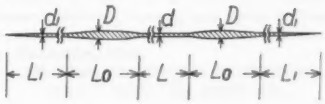


1. A skinless hollow fibre possessing a continuous longitudinally extending channel free from macromolecular material, said fibre consisting essentially of a copolymer of acrylonitrile and olefinically unsaturated comonomer containing an optionally salified sulphonic acid group, the proportion of optionally salified sulphonic acid groups in said copolymer being 1 and 50% (by number) of the monomer units and possessing micropores of average diameter less than about 100 A, between 40 and 80% of walls of the fibre being empty space, said fibre possessing zero salt rejection, measured under a pressure of 2 bars for an aqueous solution containing 10 g/l of sodium chloride.

3,930,106
ANIMAL HAIR-LIKE SYNTHETIC FIBER

Hiromichi Mihara; Yuzuru Yajima, and Yadenji Ide, all of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1973, Ser. No. 406,286
Claims priority, application Japan, Oct. 16, 1972, 47-103885
Int. Cl.² D03D *27/00;* D02G *3/00*
U.S. Cl. 428—399 3 Claims



1. An animal hair-like synthetic fiber which comprises a thermoplastic synthetic fiber having one or more narrow parts in middle part thereof and one or both sharpened end parts, and satisfying the following relationship:

$$L/D > 30,\ L_1/D > 30,\ d < 0.7D \text{ and } d_1 < 0.7D$$

wherein D is a diameter of the biggest part of the fiber, d is an average relative diameter of the narrow part, d_1 is an average relative diameter of the sharpened end part, L is a length of the narrow part and L_1 is a length of the tapered part of the sharpended end part, said thermoplastic synthetic fiber being at least one member selected from the group consisting of polyacrylonitriles, copolymers of acrylonitrile and vinyl chlo-

ride, polyamides, polyesters, polyolefins, polyvinyl chlorides and a blend of polyvinyl chloride and polyvinyl alcohol.

3,930,107

PELLETIZED UNVULCANIZED RUBBERY POLYMER

Yasuyuki Yaeda; Shigeki Hayashi, and Kazuo Kimura, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,499
Claims priority, application Japan, Dec. 30, 1972, 48-2352
Int. Cl.² B32B *25/16*
U.S. Cl. 428—407 **9 Claims**

1. Pelletized unvulcanized rubbery polymer comprising pellet cores of unvulcanized rubbery polymer and a coating layer formed thereon, said coating layer consisting of a 1,2-polybutadiene having a 1,2-addition unit content of not less than 70%, crystallinity of not less than 15%, and intrinsic viscosity [η], as measured in toluene at 30°C, of not less than 0.7 dl/g.

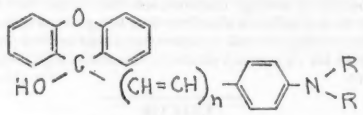
3,930,108

9-(4-AMINOPHENYL POLYMETHINE)-9-XANTHENOL COMPOUNDS AND PRESSURE SENSITIVE SYSTEM THEREWITH

Derek J. Alsop, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,988
Int. Cl.² C07D *311/90;* **C08K** *5/15*
U.S. Cl. 428—411 **10 Claims**

1. A 9-(4-aminophenyl polymethine)-9-xanthenol compound having the following structural formula:



wherein each R represents either a hydrogen atom or a lower alkyl group having from one to five carbon atoms and wherein *n* is an integer from 1 to 3.

7. In a pressure-sensitive recording system comprising a layer of microcapsules containing a substantially colorless color precursor compound and a layer of an electron-acceptor material, the improvement which comprises utilizing, as said color precursor compound, a xanthenol compound as set forth in claim **1.**

3,930,109

PROCESS FOR THE MANUFACTURE OF METALLIZED SHAPED BODIES OF MACROMOLECULAR MATERIAL

Wilhelm Brandt, Wertach, and Irmgard Bindrum, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 231,825, March 6, 1972. This application Aug. 2, 1973, Ser. No. 385,148
Claims priority, application Germany, Mar. 9, 1971, 2111136
Int. Cl.² C23C *3/02*
U.S. Cl. 428—422 **3 Claims**

1. A self-supporting film of polytetrafluoroethylene having a noble metal salt dispersed therein and a metal coating selected from the group consisting of copper and nickel on the surface of said film.

3,930,110

MANUFACTURE OF MULTILAYER PANELS USING POLYISOCYANATE: FORMALDEHYDE BINDER SYSTEM

Philip D. Shoemaker, Baker, and Hobert O. McQueary, Sweet Home, both of Oreg., assignors to Ellingson Timber Co., Baker, Oreg.

Filed Feb. 11, 1974, Ser. No. 441,278. The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.² B32B *31/02;* **B29J** *5/00*
U.S. Cl. 428—424 **5 Claims**

1. A multilayer structure comprising a layer formed by providing a mass of comminuted cellulosic material,

coating said mass with an organic polyisocyanate having at least two active isocyanate groups per molecule and with an aqueous formaldehyde solution, and

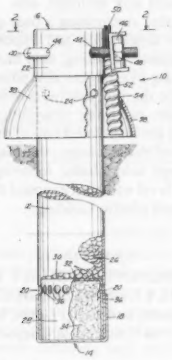
consolidating the coated mass containing polyisocyanate, formaldehyde, and water by applying pressure and heat for a time sufficient to bond the material together, the ratio of polyisocyanate to formaldehyde by weight being within the range of 2:3 to 5:1.

ELECTRICAL

3,930,111
ELECTRICAL GROUNDING DEVICE

Albert P. Sheelor, La Verne, Calif., assignor to Christian J. Reimuller, Cherry Valley, Calif.

Filed Mar. 24, 1975, Ser. No. 561,210
Int. Cl.² H01R 3/06
U.S. Cl. 174—6 8 Claims



1. An electrical grounding device for connecting the neutral ground wire of an electrical service line to the soil, comprising:

a metal pipe having openings at both ends thereof and filled with moisture-absorbing salts that are soluble in water to form a highly conductive electrolyte;

said pipe being buried in the ground with one end thereof protruding above the surface of the ground so that the openings in that end are exposed to the atmosphere, thereby allowing air to flow freely into and out of the pipe;

said moisture-absorbing salts taking moisture out of the air, which dissolves some of said salts and runs out of said openings at the bottom end of the pipe, permeating the soil to make a good electrical contact between the pipe and the soil;

means at the bottom end of said pipe for retaining said salts in said pipe;

an end cap telescopically engaged with the top end of said pipe, said pipe and end cap each having pairs of horizontally aligned holes formed in opposite sides thereof, the holes in said cap registering with the corresponding holes in the pipe;

fastening means passing through said registered holes, said fastening means terminating in threaded members projecting from said end cap on one side thereof;

a bridge member having holes at opposite ends thereof through which said threaded members pass; and

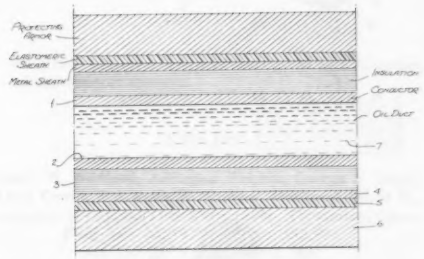
nuts screwed onto said threaded members and bearing against the outer side of said bridge member;

the neutral ground wire of the electrical service line being clamped between said bridge member and said end cap, and said fastening means serving both to lock said cap to said pipe and to secure said grounding wire to the device in a solid mechanical and electrical connection.

3,930,112
MIXED FLUID IMPREGNANT FOR OIL FILLED ELECTRIC CABLES

Franco Pasini, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 17, 1975, Ser. No. 558,834
Claims priority, application Italy, Mar. 25, 1974, 49591/74
Int. Cl.² H01B 9/06
U.S. Cl. 174—25 C 8 Claims



1. A liquid-filled underwater, electric power cable comprising a conductor surrounded by insulation, said insulation being impregnated with a mixture of a first liquid having a predetermined viscosity, a predetermined boiling point, a specific gravity less than that of water, low dielectric losses and a low dielectric constant with a second liquid miscible with said first liquid, a viscosity at least as low as that of said first liquid, a boiling point at least as high as 150°C, a specific gravity higher than that of water and dielectric losses and a dielectric constant respectively substantially at least as low as said dielectric losses and said dielectric constant of said first liquid, said first liquid being at least 50 percent by weight of the mixture and the weight of the second liquid being at least equal to the amount thereof required to provide a specific gravity of the mixture substantially equal to the specific gravity of water.

3,930,113
HIGH VOLTAGE OVERHEAD TRANSMISSION LINE CONDUCTOR WITH REDUCED WET WEATHER CORONA NOISE AND CORONA LOSSES

Inge Johansen, Heimdal, Norway, and David W. Tong, Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

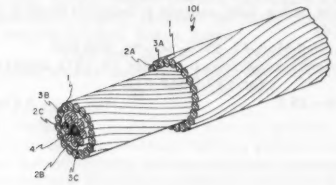
Filed June 10, 1974, Ser. No. 477,560
Int. Cl.² H02G 7/00; H01B 5/00
U.S. Cl. 174—40 R 23 Claims

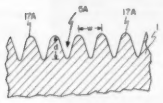
1. An electrical conductor for use in very high voltage or ultra-high voltage systems, that comprises: a plurality of conductive strands bound together in a plurality of layers, the outer surface of the conductor being moisture absorbent so that moisture is drawn by capillary action from said outer surface and toward the longitudinal axis of the conductor.

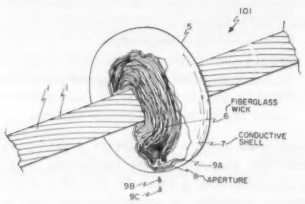
14. An electrical conductor for use as an overhead transmission line in a very-high voltage or an ultra-high voltage system, that comprises, an electrical conductor having disposed on its surface a layer of water-absorbent material that effects transport by capillary action of any water at said surface toward the longitudinal axis of the conductor, and means electrically shielding the water absorbent layer.

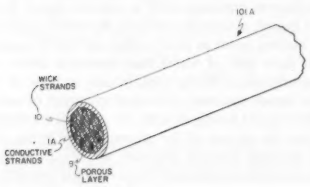
22. A method of reducing corona discharge from outdoor high voltage conductors of a transmission line during conditions of rain and fog, that comprises, drawing water drops that form on the outer surface of each conductor of the transmis-

sion line from said outer surface toward the interior of the conductor, transporting the water longitudinally within the









conductor to a drainage site, and draining the water from the conductor under conditions of reduced electric field.

3,930,114

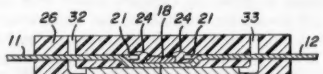
INTEGRATED CIRCUIT PACKAGE UTILIZING NOVEL HEAT SINK STRUCTURE

Robin H. Hodge, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 17, 1975, Ser. No. 558,643

Int. Cl.² H05R *9/02*

U.S. Cl. 174—52 FP **2 Claims**



1. A plastic encapsulated integrated circuit package comprising:

a lead frame including a flat die attachment pad having an IC die fixedly attached to one surface of said pad,

a pair of pad support bars, one extending from each end of said pad out to the opposite ends of said encapsulated package,

a metallic heat sink member fixedly attached to the other surface of said flat die attachment pad with its ends facing the ends of the package for conducting heat away from said IC die and die attachment pad in use,

a plurality of connector leads spaced from said die attachment pad and elevated relative to said one surface of said die attachment pad, connector wires attached between contact pads on said die and associated connector lead ends, said connector leads extending out from said circuit package,

a plastic molding encapsulating said die, said die attachment pad, said connector wires, said associated connector lead ends, and said heat sink member, and

said heat sink member comprising a base portion having an external surface level with and exposed through one surface of said plastic molding, said base portion having two pairs of spring-like fingers extending upwardly from the upper surface thereof, one pair at either end of said heat sink member, each pair straddling the pad support bar passing from the associated end of the die attachment pad to the end of the package, the ends of said fingers extending through said plastic molding and having an external surface level with and exposed through the opposite surface of said plastic molding.

3,930,115

ELECTRIC COMPONENT ASSEMBLY COMPRISING INSULATING FOIL BEARING CONDUCTOR TRACKS

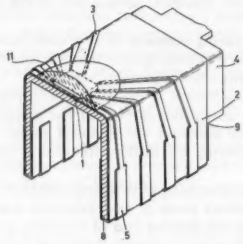
Edward Uden, Tangstedt, and Bengi Gotze, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 232,865, March 8, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 449,850

Claims priority, application Germany, May 19, 1971, 2124887

Int. Cl.² H05K *1/18*

U.S. Cl. 174—52 FP **8 Claims**



7. A sub-assembly for incorporating an electric component with a connection fitting, comprising,

a. a supporting member having a substantially U-shaped profile comprising a base portion and limb portions, said limb portions comprising connection regions and inner and outer surface and being adapted to permit said subassembly to be incorporated with a connection fitting, said base portion comprising at least one of a recess and a perforated region adapted to receive said electric component thereat;

b. a flexible, electrically insulating foil secured on said supporting member and having at least a portion thereof disposed at at least one of said inner and outer surfaces of said limb portions; and

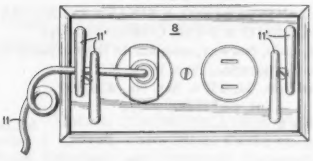
c. conductor tracks located on said foil and extending over said base portion, said tracks being adapted to be electrically connected to said electric component and comprising connection zones disposed at respective said connec-

tion regions of said limb portions, whereby said connection zones are inserted into and contact said connection fitting when said sub-assembly is incorporated with said connection fitting.

3,930,116
ELECTRIC OUTLET FACE PLATES OR COVERS

Theodore W. Richards, 1936 Sloat Blvd., San Francisco, Calif. 94116

Filed Sept. 18, 1973, Ser. No. 398,385
Int. Cl.² H02G 3/14
U.S. Cl. 174—66 **1 Claim**



1. A one-piece face plate for an electric outlet of a conventional plug and socket type electrical connector, said face plate having at least one opening therein and being adapted to overlie the outlet when said face plate is secured in place thereon with said opening exposing said socket, said face plate having plug and wire retaining and guiding means formed integrally therewith, said means being positioned between a side of said opening disposed toward an edge of said plate proximate said opening, said means including a pair of substantially L-shaped members arranged in a parallel spaced relation, with each having one end thereof formed integrally with said face plate, said L-shaped members having the free portions thereof extending in opposite directions from their ends and in side by side overlapping relationship to one another, and each being spaced substantially equally from and substantially parallel to the plane of said face plate, said wire underlying said free portions with said plug being retained thereby, a portion of a said wire leading to and adjacent said plug being maintained in substantially parallel relation to the plane of said face plate, and extending outwardly from said plug toward said proximate edge of said plate, the arrangement serving to prevent a direct outward pull on said plug with respect to said plate which would tend to unintentionally disconnect said plug from its cooperating socket, and said plug being prevented from passing between said face plate and said members when said plug is disconnected from its cooperating socket.

3,930,117
VIDEO CAPACITIVE DISC PLAYBACK APPARATUS AND STYLUS WITH DIELECTRIC COATING THEREFOR

Jon Kaufmann Clemens, Skillman, and Richard Claxton Palmer, Blawenburg, both of N.J., assignors to RCA Corporation, New York, N.Y.

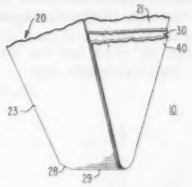
Filed Nov. 14, 1974, Ser. No. 523,311
Int. Cl.² H04N 5/76
U.S. Cl. 178—6.6 R **10 Claims**

1. A stylus comprising, in combination:

a support element of dielectric material tapering to a tip at one end thereof and having a substantially flat face, said tip having a curved bottom surface of a given length terminating at said face;

a layer of conductive material of a given thickness adherent to said face; and

a coating of dielectric material overlying said conductive layer and having a thickness which is large relative to the thickness of said conductive layer, and which is small

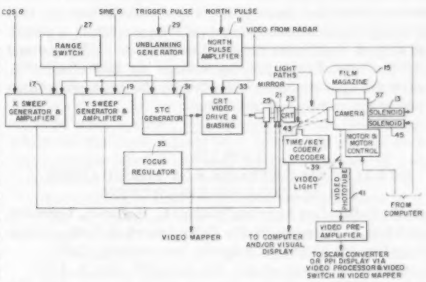


relative to said given length of said curved bottom surface of said support element.

3,930,118
RADAR RECORDER SYSTEM

Richard W. Midland, Arlington Heights; George S. Bayer, Long Grove, and Keith H. Kreiger, Maywood, all of Ill., assignors to General Time Corporation, Thomaston, Conn.

Filed Apr. 24, 1973, Ser. No. 353,985
Int. Cl.² G01S 9/02; H04N 5/88
U.S. Cl. 178—6.7 R **2 Claims**

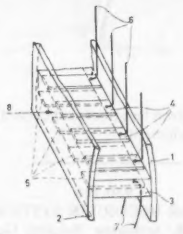


1. A radar recording and video playback system comprising in combination cathode ray tube means for displaying a radar sweep signal, means receiving said radar signal for driving said cathode ray tube, a motion picture camera aligned opposite the face of the cathode ray tube, a film magazine mounted on said camera, undeveloped motion picture film mounted in said magazine for relative movement with respect to said camera, a solenoid means for advancing said undeveloped film in said camera, a frame of which advances each time said radar sweep completes rotation through a 360° angle, the face of said cathode ray tube having a long period phosphor decay substance thereon, said camera having a shutter with a rapid shutter speed for minimizing information loss for each advancement of the film, a coded means including a mirror for directing identification data onto a portion of the undeveloped film frame being exposed, the cathode ray tube having an electron beam which scans the face of said tube for producing a source of light, the motion picture film magazine including therein a developed motion picture film substituted for the undeveloped film, and a video phototube means for directing the light from the electron beam of the cathode ray tube through frames on said developed film in said camera onto said video phototube, whereby said camera has its shutter in a position which so enables the light to pass through the frames, said phototube converting video information on said developed film into a corresponding electrical signal, and means for advancing said developed film in said camera.

3,930,119
FACSIMILE APPARATUS FOR WRITING AND READING MECHANICALLY MOVING DOCUMENTS

Rolf Schmidt, Rott; Klaus Carl, Aachen, both of Germany; Pol Ambroise Ghislain Joseph Gustin, and Raymond Georges Schayes, both of Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,794
Int. Cl.² H04N *1/24*
U.S. Cl. 178—7.6 **10 Claims**

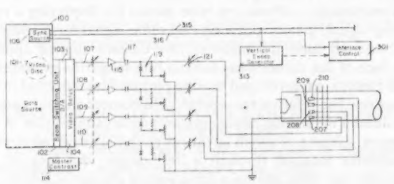


1. Facsimile apparatus using positionally controllable light beams for writing and reading information on mechanically moving documents, said apparatus comprising a pair of polarization filters, an electronically controllable switching mask plate having two major faces and consisting of mixed crystals of lead zirconate and lead titanate doped with lanthanum, said plate being disposed between said polarisation filters, a plurality of aligned electrodes disposed in rows on said plate and means for selectively applying voltage to said electrodes, whereby the light which is controlled by the mask plate scans the document to be read or written.

3,930,120
MULTI-BEAM CATHODE RAY TUBE HAVING EQUALIZED LINE BRIGHTNESS

Bruce W. Keller, Los Angeles; William C. Hoffman, Torrance, and Elvin E. Herman, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 431,200, Jan. 7, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,774
Int. Cl.² H04N *5/19*
U.S. Cl. 178—7.7 **9 Claims**

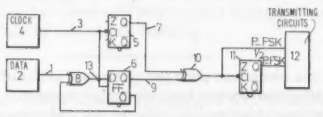


1. A display system having equalized line brightness comprising:
- a source of sensor data having said data arranged in a predetermined number of N data lines:
- display means for displaying a raster of data thereon having N display beams, positioned relative to said screen and relative to each other so that said N beams define N lines on said display means and form a raster of N lines by painting N lines at a time, said N beams being less than said N lines displayed on said display means:
- data select means coupling said source of data to said display means for reading out selected lines of data N lines at a time beginning at a data second line to form a subsequent raster display on said display means;
- scanning means coupled to said display means for simultaneously scanning said N beams across said display means in a first dimension;
- deflecting means coupled to said data select means and to said display means for simultaneously deflecting said N beams in a second dimension for forming a raster by tracing N lines at a time: and
- said scanning means and said deflecting means paint a first raster commencing by tracing a first data line from said data select means at a first display line position on said display means by a display beam, and said scanning means paint a second raster commencing tracing a second data line from said select means at a second display line position by said first display beam.

3,930,121
METHOD FOR CONVERTING A BINARY CODED DATA SIGNAL INTO A P-FSK CODED SIGNAL

Odd Mathiesen, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 24, 1974, Ser. No. 436,309
Int. Cl.² H04L *27/12*
U.S. Cl. 178—66 R **6 Claims**



1. An apparatus for converting a binary coded data signal into a pulse frequency modulated code (P-FSK), wherein the frequency of said code is that of a clock signal when the data signal is in a first binary state, and wherein the frequency of said code is half that of said clock signal when said data signal is in a second binary state comprising:
- means for providing a binary data signal;
- means for providing a clock signal;
- means for generating a first binary output signal which changes state at half the frequency of said clock signal when said binary data signal is in said first binary state, said means for generating comprising:
  - an exclusive OR-gate having first and second inputs, said first input coupled to said data source; and
  - a delay flip-flop having a first input coupled to the output of said exclusive OR-gate and a second input coupled to said clock signal, the inverted output of said delay flip-flop coupled to the second input of said exclusive OR-gate such that when said binary data signal is in a second binary state, said first binary output signal is in the same state as the output of said delay flip-flop;
- means for generating a second binary output signal having a frequency half that of said clock signal; and
- means for combining said first output signal and said second output signal to produce said pulse frequency modulated code.

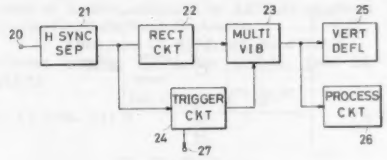
3,930,122
OSCILLATOR SYNCHRONIZATION CIRCUIT IN A TELEVISION CAMERA

Akiyoshi Morita, Sagamihara, and Tomotada Enami, Tokyo, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 28, 1974, Ser. No. 455,959
Claims priority, application Japan, Mar. 31, 1973, 48-37175
Int. Cl.² H04L *7/00*; H03B *3/04*
U.S. Cl. 178—69.5 TV **4 Claims**

4. An oscillator synchronization circuit according to claim 2 wherein said detecting circuit comprises a circuit for separating a horizontal synchronizing signal from said externally

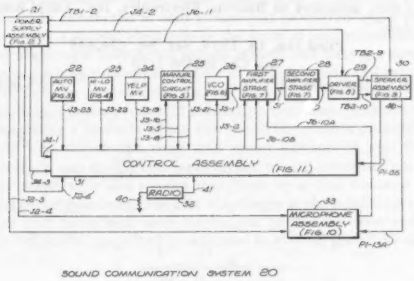
originating synchronizing signal and a circuit for rectifying said horizontal synchronizing signal separated by said separator circuit and for supplying the resulting output DC voltage as a bias to said oscillator.



3,930,123
SOUND COMMUNICATION SYSTEM

Gordon S. Carroll, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 410,776, Oct. 29, 1973, Pat. No. 3,873,980. This application Sept. 25, 1974, Ser. No. 509,067
Int. Cl.² G08B 3/10
U.S. Cl. 179—1 R **4 Claims**



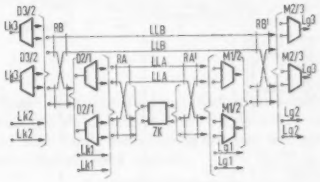
SOUND COMMUNICATION SYSTEM 20

1. A sound communication system comprising: amplifier means having at least first, second and third input leads, and an output lead, said amplifier means being adapted to produce an output signal on said output lead thereof which is directly proportional to the sum of the signals on said first, second and third input leads thereof; alternate means selectively operable to impress a variable audio frequency signal on said amplifier means first input lead; a source having an output lead, said source being adapted to produce audio frequency signals on said output lead thereof; a double-pole, double-throw switch having first and second ganged poles and first and second contacts respectively engageable by said first and second poles; means responsive to engagement of said first pole with said first contact for connecting said source output lead to said amplifier means second input lead; and output means having an input lead connected from said amplifier means output lead for broadcasting audible sound in accordance with the amplitudes and frequencies of the A.C. components in signal appearing on the said output lead of said amplifier means, said output means including a speaker having a negative feedback lead, said second pole and second contact forming a single-pole switch which is connected in series from said negative feedback lead to said amplifier means third input lead.

3,930,124
PCM TIME-DIVISION MULTIPLEX TELECOMMUNICATION NETWORK

Karl-Anton Lutz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 25, 1974, Ser. No. 483,021
Claims priority, application Germany, June 29, 1973, 2333254
Int. Cl.² H04J 3/16
U.S. Cl. 179—15 AT **1 Claim**



1. In a PCM time division multiplex telecommunication network having a plurality of PCM time division multiplex central offices interconnected by means of time division multiplex lines, wherein on at least one part of the time division multiplex lines PCM superordinate systems are constituted by interleaving, on a time division basis, time periods pertaining to PCM basic systems, and wherein data are transmitted for which all the time periods of a PCM basic system or PCM superordinate system are used for the formation of a single transmission channel, the improvement comprising:

a time division multiplex switching network and at least one pair of space division multiplex switching networks in each central office, said space division networks having corresponding parts on the receive side of said time division network connected to corresponding send side parts through the connection of outputs of the receive side with inputs of the send side,

demultiplexer means fo uninterleaving higher order PCM systems into PCM systems of the next lower order having outputs connected to inputs of receive side parts of the pair of space division multiplex networks, said receive side inputs being connected also to interexchange trunks, multiplexers for interleaving lower order PCM systems into PCM systems of the next higher order having inputs connected to outputs of send side parts of the space division multiplex networks, said send side outputs being connected also to time division multiplex lines for PCM systems of a higher order,

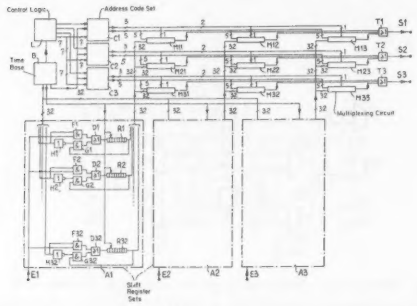
means connecting receive side parts of space division multiplex switching networks not used for the direct connection with the other part of the pair, with respect to the part of the pair of space division networks for through - connecting PCM basic systems, to inputs of the time division network, and with respect to parts of the pair of space division networks for through - connecting higher order PCM systems, to inputs of corresponding ones of said multiplexers,

means connecting inputs of send side parts of said pair of space division networks not used for direct connection with the other part of the pair, with respect to a part for through connecting PCM basic systems, to outputs of said time division network, and with respect to a part for through connecting higher order PCM systems to outputs of corresponding ones of said dimultiplexers.

3,930,125
CONNECTION NETWORK FOR A TIME SWITCHING AUTOMATIC ELECTRONIC EXCHANGE

Jean A. Picandet, Paris, France, assignor to Jeumont-Schneider, Puteaux, France

Filed July 5, 1974, Ser. No. 486,080
Claims priority, application France, July 6, 1973, 73.24841
Int. Cl.² H04Q *11/04*
U.S. Cl. 179—15 AQ **9 Claims**



1. A connection network for connecting incoming channels to outgoing channels in an automatic electronic time switching PCM exchange comprising:

a first set of circulating shift registers for each incoming PCM channel, the number of circulating shift registers in each set equal to the number of time slots in an incoming channel, said first set of circulating shift registers providing a serial bit output,

a set of multiplexing circuits for each outgoing channel the number of circuits in each set equal in number to the number of incoming channels,

means for directly connecting the serial bit output from said first set of circulating shift registers to said multiplexing circuits,

means for connecting said multiplexing circuits to said outgoing channels,

means for providing address codes to said multiplexing circuits for identifying a circulating shift register within said first set of circulating shift registers for each incoming PCM channel, and

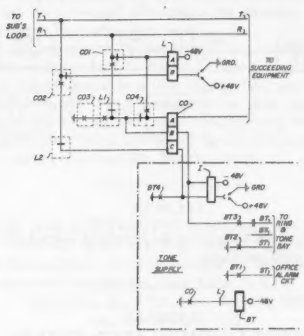
clock means for shifting said circulating shift registers and for actuating said address code providing means.

3,930,126
TWO RELAY LINE CIRCUIT

John Hugh Green, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,301
Int. Cl.² H04M *3/16*
U.S. Cl. 179—19 **3 Claims**

1. A line circuit for an automatic telephone system comprising a first and second multiple winding relay, said relays being released during normal conditions, said line circuit including a path for operating said first relay over a first winding responsive to a closed loop condition on a line individual to the line circuit, means for operating said second relay responsive to closure of a path to said line circuit, means for maintaining said second relay operated over a path through contacts of said first relay, means responsive to a lockout condition for releasing said first relay and for maintaining said second relay in an operated condition over a path through said second relay following release of said first relay and restoration of said contacts of said first relay, said second relay operative to test said line for continued closed loop condition after release of said first relay, wherein the path for originally operating said second relay includes two windings of said second relay, and

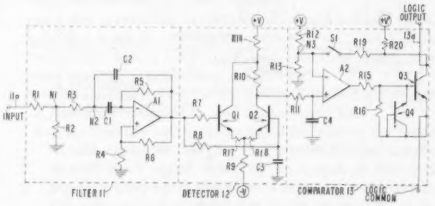


a path for maintaining said second relay operated includes two windings of said second relay in series with the line loop.

3,930,127
TONE DETECTOR

George H. Warren, and Gunnar Hurtig, III, both of San Jose, Calif., assignors to Baldwin Electronics, Inc., Little Rock, Ark.

Filed Jan. 18, 1974, Ser. No. 434,445
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **13 Claims**



1. A tone detector circuit comprising:

means for filtering an input signal to produce a first output signal at a first selected frequency, said means for filtering comprising amplifier means including an inverting and a non-inverting input lead and an output lead, first feedback means connecting said output lead to said inverting input lead, second feedback means connecting said output lead to said non-inverting input lead, means connecting said non-inverting input lead to a first reference potential, means for transmitting said input signal to said inverting input lead, and means electrically connecting said means for transmitting to said output lead;

means for detecting said first output signal to produce a second output signal; and

means for comparing said second output signal to a reference signal to produce a bilevel output signal, said bilevel output signal having a first level when said first output signal has an amplitude greater than a selected value and said bilevel output signal having a second level when said first output signal has an amplitude less than said selected value.

3,930,128
ELECTRET DIAPHRAGM MICROPHONE WITH MEANS TO CORRUGATE THE DIAPHRAGM WHEN IN AN OVERSTRESSED CONDITION

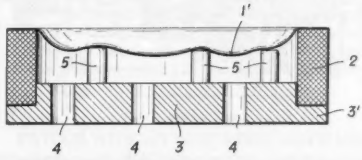
Werner Fidi, Baden, and Herbert Piribauer, Wiener Neustadt, both of Austria, assignors to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H., Austria

Filed June 12, 1974, Ser. No. 478,735

Claims priority, application Austria, June 26, 1973, 5624/73

Int. Cl.² H04R *19/04*

U.S. Cl. 179—111 R **6 Claims**



1. A condenser microphone, comprising an electrode having a surface, an electret diaphragm at a spaced location from said surface, and means for corrugating said diaphragm in the event said diaphragm becomes overstressed, comprising at least one pin-like projection extending outwardly from said surface in normally spaced relation to said electrode, the space between said pin-like projection and said diaphragm being unimpeded to permit oscillation of said diaphragm in response to normal sound waves.

2. A condenser microphone comprising a mount, a first electrode connected to said mount and having an upper surface, and a second electrode in the form of an electretifiable foil diaphragm connected to said mount and having a lower surface facing said upper surface of said electrode and spaced therefrom by a small distance, and means for corrugating said diaphragm in the event said diaphragm becomes overstressed, comprising a plurality of pin-like raised projections projecting from and distributed over said upper surface of said first electrode and having end faces turned to said lower surface of said diaphragm and spaced therefrom by a free distance so that a free space adjacent said diaphragm is provided between said end faces and said diaphragm permitting unimpeded oscillations of the latter in response to normal sound waves.

3,930,129
ELECTRODYNAMIC LOUDSPEAKER WITH BASKET MOUNTING TO POLE PIECE

Hyman Cohen, 3898 Grosvenor Road, South Euclid, Ohio 44118; Paul Vago, 3396 Kildare Road, Cleveland Hts., Ohio 44118, and Davorin Skender, 790 Babbitt Road, Euclid, Ohio 44123

Filed May 14, 1974, Ser. No. 469,879

Int. Cl.² H04R *9/02*

U.S. Cl. 179—115.5 R **2 Claims**

1. An electrical loudspeaker comprising:

a housing having a circular opening therein,

diaphragm means secured within said housing for generating sound waves,

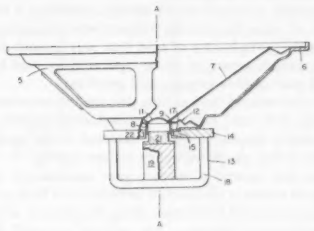
magnetic means for creating a constant magnetic field, said magnetic means including an aperture therein,

electromagnetic means secured to said diaphragm means, for vibrating said diaphragm means,

flange means, formed integrally with said housing about said circular opening in said housing and extending through said aperture in said magnetic means, and

flange receiving means within said magnetic means for retaining said flange means, said magnetic means including a plate in which said aperture is formed and an annular recess concentric about said aperture on one side of said plate,

said housing including an annular shoulder concentric about said circular opening and adapted to be received in said annular recess to center said housing with respect to said plate



said flange receiving means including an annular groove concentric about said aperture on the other side of said plate, said flange means being crimped into said annular groove and retained thereby.

3,930,130
CARBON FIBER STRENGTHENED SPEAKER CONE

Samuel M. Boszor, Parma, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,319

Int. Cl.² H04R *7/26*

U.S. Cl. 179—181 R **11 Claims**

1. A loudspeaker diaphragm, said diaphragm consisting essentially of a carbonaceous fibrous web of carbon fibers and a resin, said carbon fibers representing between about 30% and about 70% by volume of said diaphragm, the balance being said resin, said diaphragm having a Young's modulus between about 3 million psi and about 30 million psi and a density between about 0.8 gm/cm³ and about 1.7 gm/cm³ so as to provide a sonic velocity for said diaphragm between about 2.5×10^5 cm/sec and about 11×10^5 cm/sec.

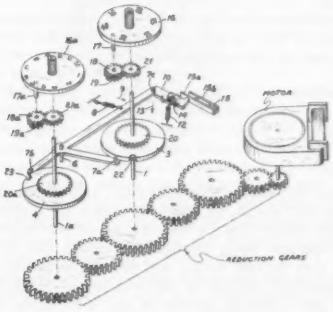
3,930,131
TIMER FOR CONTROLLING THE OPERATION OF ELECTRICAL DEVICES

Rintaro Nishina, Yonezawa, Japan, assignor to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Feb. 14, 1974, Ser. No. 442,619

Int. Cl.² H01H *43/00*; **G04F** *3/02*

U.S. Cl. 200—35 R **9 Claims**



1. A timer comprising

a. first shaft means for intermittent rotation at a relatively high speed;

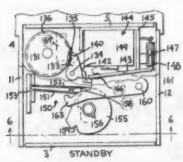
b. second shaft means for intermittent rotation at a relatively low speed;
c. first and second grooved disc means mounted on said first and second shaft means respectively for free rotation thereon, each of said disc means being provided with a groove on its periphery;
d. pivotally mounted lever means including a lever and a pair of pins thereon for respectively engaging with said pins the peripheries of said first and second disc means;
e. a switch arranged to be operated by said lever when said pair of pins engage said grooves;
f. first and second time setting disc means associated respectively with said first and second shaft means, for being rotatably displaced by an external force, said displacement being proportional to a time setting;
g. first and second planetary gear mechanism means, the first of which is connected between said first grooved disc means and said first time setting disc means, and the other is connected between said second grooved disc means and said second time setting disc means; and said first and second planetary gear mechanism means being drivably connected respectively to said first and second shaft means for rotatably displacing said grooved disc means proportional to the displacement of the corresponding time setting disc means, and for rotatably turning in the opposite sense said grooved disc means and said time setting disc means driven by rotation of its corresponding shaft means;

whereby for a timer in an initial position with the pins positioned at the grooves of the grooved disc means, has a desired time setting rotatably entered on the time setting disc means which displace said grooved disc means proportionally, after which said shaft means drive said discs through said planetary gear means until said grooves are brought to engagement with said pins thus activating said switch.

3,930,132
PROGRAM CENTRALLED, CAM OPERATED SWITCH ASSEMBLY

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Division of Ser. No. 321,715, Jan. 8, 1973, Pat. No. 3,833,818, which is a division of Ser. No. 179,422, Sept. 10, 1971, Pat. No. 3,745,293. This application Mar. 18, 1974, Ser. No. 451,886
Int. Cl. H01h *43/00*
U.S. Cl. 200—38 R **3 Claims**

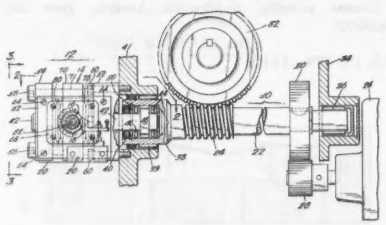


1. In a control mechanism, a switch, cam means arranged to operate said switch, an operator, means for supporting said operator and providing a limited range of movement therefor , said operator being arranged to operate said switch conjointly with the cam means, said cam means having two separate camming portions at different levels for operating the switch, the camming portion at one level being within the range of movement of the operator providing conjoint operation of the switch, and the camming portion at the other level being beyond the range of movement of the operator to exclude operation of the switch by the operator.

3,930,133
LIMIT SWITCH ASSEMBLY

Harry E. Sulzer, Warminster, Pa., assignor to Quaker City Gear Works, Inc., Huntingdon Valley, Pa.

Filed Oct. 24, 1974, Ser. No. 517,471
Int. Cl.² H01H *3/16*
U.S. Cl. 200—47 **16 Claims**

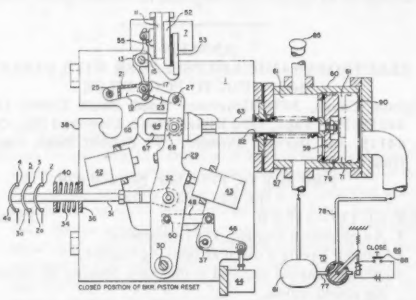


1. A limit switch assembly comprising slider means movable with axial movement of an input shaft, cam means carried by said slider means for movement therewith and actuator means located adjacent switch means and having a first position spaced from said switch means and a second position in engagement with said switch means, said cam means being engaged with said actuator means in said first and second positions thereof and being operatiave to move said actuator means from said first position to said second position when said slider means moves in one direction, whereby a limit signal is developed, said cam means further being adjustable whereby the spacing between said first and second positions of said actuator means is adjustable.

3,930,134
PNEUMATIC POWER-UNIT HAVING A DRIVING PISTON AND AN EXHAUST VALVE

Joseph R. Rostron, Monroeville; Lawrence A. Brunson, and Otto H. Soles, both of Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 27, 1973, Ser. No. 401,520
Int. Cl.² H01H *35/38*
U.S. Cl. 200—82 B **16 Claims**



1. An operating mechanism for a circuit-interrupter including in combination:
a. means defining separable contact means;
b. a movable member;
c. means rendering opening and closing motions of said separable contact means responsive to the movement of said movable member (**29**);
d. a pneumatic operator including a driving-piston operable within a pneumatic operating cylinder and having a piston-rod extending externally out of said pneumatic operating cylinder;

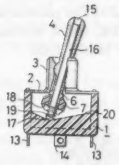
e. said piston rod being connected with said movable member (29) to cause the actuation thereof;
f. said piston-rod extending only out of one end of the operating cylinder on one working side of the driving piston;
g. the other end of the operating cylinder on the nonworking side of the piston being closed with respect to the piston-rod;
h. valve means normally maintaining high-pressure gas within said pneumatic operating cylinder on both the driving and non-driving sides of the driving-piston to thereby extend the piston-rod outwardly by differential piston action; and,
i. means for operating said valve means and exhausting gas from the non-driving side of the driving-piston at said other end of the cylinder to thereby move the driving-piston toward the closed end of the operating cylinder and the movable member (29) to close the breaker contacts.

3,930,135

SWITCH WITH AN INDICATING MECHANISM

Yasuo Kodaira, 5-14 Minamimagome, 1-chome, Ota-ku, Tokyo, Japan

Filed June 18, 1973, Ser. No. 371,073
Claims priority, application Japan, Dec. 29, 1972, 48-263[U]
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H01H 9/16
U.S. Cl. 200—308 11 Claims



1. In a switch an indicating mechanism comprising:
an actuating member having a longitudinally extending bore;
a movable indicating member slidably received in said bore;
a switch case including at least one inclined surface formed in the switch case;
a spring located at the lower end of said movable indicating member, urging the lower end of said member to make contact with and move along said inclined surface;
whereby the upper end of the indicating member is made to be selectively visible or concealed by extending out of or being recessed within the upper surface of the actuator in accordance with the operating position of said actuating member.

2. A switch with an indicating mechanism as set forth in claim 1 wherein said spring is inserted between a collar on said indicating member and a hemispherical portion provided at the lower end thereof.

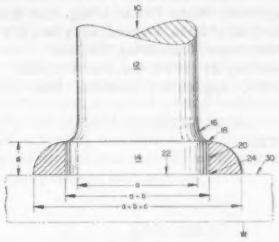
3,930,136

ANCHOR STUDS AND SHEAR CONNECTORS USED IN WELDING

Albert P. Denis, 2050 Brookview Road, Castleton, N.Y. 12033

Filed Nov. 5, 1973, Ser. No. 412,708
Int. Cl.² B23K 9/20
U.S. Cl. 219—99 4 Claims

3. The method of electric arc welding comprising: placing upon a work a stud having a shank of a first diameter and at its weld end a base of enlarged diameter and of a base height of a predetermined minimum dimension, introducing a conventional welding electrode within the welding area, initiating an arc through the electrode, and forming a fillet of effective throat having a radial throat dimension throughout not in excess of the enlarged base height of predetermined minimum demension, such that the area of metal contact in the weld fillet adjacent the periphery of said enlarged base and the work is equal to or greater than the cross-sectional area of said shank.

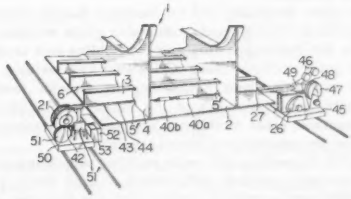


3,930,137

METHOD AND APPARATUS FOR FILLETT WELDING LONGITUDINAL MEMBERS OF FRAMED STRUCTURES

Shimpei Iizuka, and Katsumi Ishimoto, both of Yokosuka, Japan, assignors to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,492
Claims priority, application Japan, July 4, 1973, 48-74888; July 4, 1973, 48-74889; Oct. 16, 1973, 48-115279
Int. Cl.² B23K 9/12
U.S. Cl. 219—125 R 12 Claims



1. In an assembly of a framed structure comprising a horizontal plate, a plurality of parallel transverse members, and a plurality of parallel longitudinal members, said transverse and longitudinal members being arranged perpendicular to each other, wherein said transverse members have a small opening formed therethrough at every corner defined by said horizontal plate and said longitudinal members so that the spaces defined by the adjacent transverse members may be intercommunicated with each other,
a method for fillet welding said longitudinal members to said horizontal plate comprising the steps of
a. connecting one end of a length of chain to a welding apparatus, said chain extending from one end of one of said longitudinal members to be welded to the other end thereof including passing said chain through said small openings of said transverse members, said welding apparatus comprising wheels for carrying said welding apparatus upon said horizontal plate, and at least one welding torch holding therein an electrode wire; and
b. supplying the welding current to said electrode wire while said chain is pulled through said small openings so that said welding apparatus travels along one side surface of said one longitudinal member passing through said small openings of said transverse members as it moves from one end to the other end of said one longitudinal member,

whereby said one longitudinal member may be continuously fillet welded to said horizontal plate.

3,930,138
APPARATUS FOR WELDING VERTICAL JOINTS

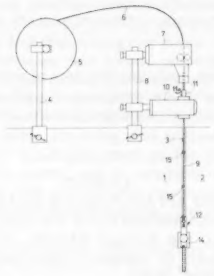
Karl-Erik Knipstrom; Heinz Oskar Uhlig, and Knut Folke Ingemar Boden, all of Laxa, Finland, assignors to Elektriska Svetsningsaktiebolaget, Gotenburg, Sweden

Filed May 21, 1974, Ser. No. 471,902

Claims priority, application Sweden, May 22, 1973, 7307170

Int. Cl.² B23K *9/12, 9/28*

U.S. Cl. 219—126 **4 Claims**



1. Apparatus for welding a substantially vertical joint between two metal parts separated by a welding gap, comprising a consumable, tubular guide member provided with an external screw thread,

means for supplying a welding current to said consumable guide member,

an electrode advancing unit for feeding a fusible electrode downwards through said consumable guide member,

a guide member supporting unit for holding said consumable guide member along and within said welding gap, said supporting unit comprising an annular member mounted for rotation in said unit, means for clamping the consumable guide member in said annular member, and means for rotating said annular member,

means for supporting said guide member supporting unit in a stationary position with regard to said metal parts, welding pool confining means vertically movable along the welding gap, and,

means supporting said welding pool confining means comprising a nut member engaging the screw thread of the consumable guide member.

3,930,139
NONCONSUMABLE ELECTRODE FOR OXYGEN ARC WORKING

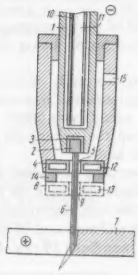
David Grigorievich Bykhovsky, Konjushenny pereulok, 1, kv. 18; Alexandr Yakovlevich Medvedev, ulitsa Kalyaeva 3, kv. 17; Yakov Vulfovich Rossomakho, prospekt Nauki 14/1, kv. 231, all of Leningrad, and Margarita Nikolaevna Butova, ulitsa Shabolovka 63/1, kv. 58, Moscow, all of U.S.S.R.

Filed May 28, 1974, Ser. No. 474,076

Int. Cl.² B23K *35/04, 9/26*

U.S. Cl. 219—145 **4 Claims**

1. A nonconsumable electrode for oxygen arc working, comprising: a holder made from a metal selected from the group consisting of copper and alloys thereof; an active insert fastened to the end face of said holder and produced from a metal selected from the group consisting of hafnium, and hafnium in combination with dopants selected from the group consisting of yttrium oxide; neodymium oxide, and a combination of yttrium and neodymium oxides; a metal spacer disposed between said holder and said active insert extending over the entire contact surface area thereof so that said active insert is in thermal and electric contact with said holder through said metal spacer; and with said metal spacer being a metal selected from the group consisting of aluminium and alloys thereof.



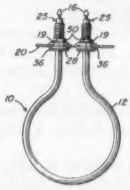
3,930,140
ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 5805 Folkestone Drive, Dayton, Ohio 45459

Continuation-in-part of Ser. No. 334,002, Feb. 20, 1973, Pat. No. 3,800,415, which is a division of Ser. No. 244,516, April 17, 1972, Pat. No. 3,732,398, and a continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application Mar. 25, 1974, Ser. No. 454,291The portion of the term of this patent subsequent to Apr. 18, 1989, has been disclaimed.

Int. Cl.² H05B *1/00*

U.S. Cl. 219—316 **10 Claims**

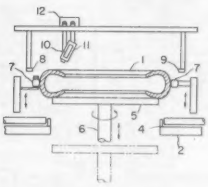


1. A heating element and fitting assembly for mounting within spaced openings in a wall of a liquid heating vessel, said assembly comprising an elongated tubular sheath having opposite end portions, an electrical resistance heating element extending longitudinally within said sheath and supported therein by a thermally conductive insulator material, an electrical connector connected to each end of said heating element and projecting through the corresponding said end portion of said sheath, a sheet metal tubular fitting mounted on each said end portion of said sheath and adapted to extend through the corresponding opening within the wall, each said fitting having a substantially uniform wall thickness and including an outwardly projecting peripheral flange portion integrally connected to a tubular wall portion, said flange portion of each said fitting includes a radially outwardly projecting annular wall integrally connected to a radially inwardly projecting annular wall providing said flange portion with a double wall thickness, said tubular wall portion of each said fitting having a deformed wall configuration forming an outwardly projecting threaded portion around said sheath, each said fitting including a portion in radial gripping engagement with the corresponding said end portion of said sheath to form an electrical conductor therewith and for securing said fitting to said end portion of said sheath, and means forming a liquid-tight seal between each said fitting and said sheath.

3,930,141
AUTOMATIC TIRE CLASSIFYING APPARATUS

Masao Koyama, Hatano; Hiromitsu Akashi; Yoichi Nishikawa, both of Hiratsuka; Susumu Fujiwara, Fujisawa, and Takao Okada, Yokohama, all of Japan, assignors to The Yokohama Rubber Company, Ltd., Japan

Filed Oct. 4, 1974, Ser. No. 512,163
Claims priority, application Japan, Oct. 9, 1973, 48-112848
Int. Cl.² G06K *7/10;* **B60C** *13/00*
U.S. Cl. 235—61.11 E **4 Claims**

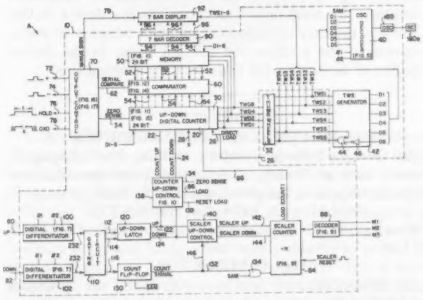


1. An automatic tire classifying apparatus which comprises:
a. an illumination light source for illuminating a classification mark which is provided on a part of the surface of each tire for representing the kind of the tire;
b. a camera tube for detecting the classification mark thus illuminated by the light source thereby to produce electrical signals accordingly;
c. a rotary mechanism operating to relatively rotate the tire and the axis of a light beam incident to the camera tube so that the camera tube can detect the classification mark within the angle of view;
d. a position adjusting mechanism for adjusting the relative positions of the camera tube and the light source and the tire;
e. a mark reading section for reading the classification mark by analyzing the electrical signals produced by the camera tube; and
f. an identification section for discriminating the kind of the tire by identifying the electrical signals read by the mark reading section.

3,930,142
DIGITAL TIMER AND COUNTER DEVICE WITH DUAL CONTROL

Carl H. Meier, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed June 13, 1974, Ser. No. 478,979
Int. Cl.² H03K *21/00*
U.S. Cl. 235—92 EV **81 Claims**

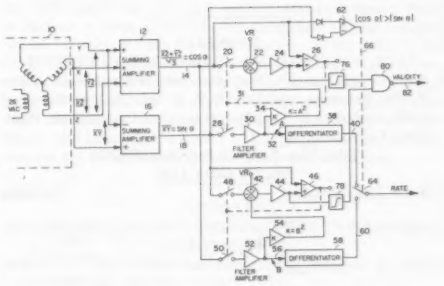


1. A digital counting device for counting input pulses and producing an output signal after a given number of said input pulses, said counting device comprising: a binary counter responsive to input counts and having a first mode select means for causing up binary counting of said counter upon receipt of input counts and a second mode select means for causing down binary counting of said counter upon receipt of input counts; a binary memory circuit; means interconnecting said binary counter and said binary memory circuit for creating a compare signal when the binary number of said binary counter corresponds to the binary number in said memory circuit; means for creating a sense signal when said binary counter reaches a given number; means responsive to either of said compare signal or said sense signal for creating said output signal; means for selecting a binary coded number; first control means including means for loading said selected coded number into said counter and means for activating said second mode select means; a second control means including means for loading said selected number into said memory circuit and means for activating said first mode select means; means for selecting only one of said control means; and, means for introducing input pulses to said counter.

3,930,143
CIRCUIT FOR MEASURING THE RATE OF SYNCHRO ROTATION

Hans Rudolf Muller, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed May 27, 1975, Ser. No. 581,394
Int. Cl.² G06G *7/78, 7/22*
U.S. Cl. 235—150.2 **15 Claims**



1. A circuit for generating a signal representing the rate of rotation of a synchro comprising:
means for generating a cosine signal representing the cosine of the synchro shaft angle;
means for generating a sine signal representing the sine of the synchro angle;
means responsive to said sine signal and said cosine signal, for generating a tangent signal representing the tangent of the synchro shaft angle;
means, responsive to said cosine and said sine signals, for generating a cotangent signal representing the cotangent of the synchro shaft angle;
first differentiator means for differentiating said tangent signal into a first rate signal;
second differentiator means for differentiating said cotangent signal into a second rate signal; and
switch means, responsive to said sine and said cosine signal, for selecting one of said rate signals having substantially linear characteristics.

3,930,144
DIGITAL FUNCTION FITTER

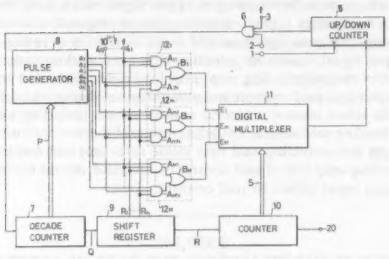
Katsuaki Tanaka, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sept. 20, 1974, Ser. No. 507,856
Claims priority, application Japan, Sept. 29, 1973, 48-110033
Int. Cl.² G06F *15/34*
U.S. Cl. 235—150.53 **7 Claims**

1. A digital function fitter comprising: means for storing a number of input pulses; a first clock pulse generator;

means for counting the number of clock pulses;

a plurality of second clock pulse generators generating pulses different from one another in frequency; and



means for supplying clock pulses with different frequencies for predetermined intervals to said storing means, said clock pulses ceasing to be applied by said first clock pulse generator to said counting means when the pulses supplied to said storing means coincide with a stored number of input pulses.

3,930,145

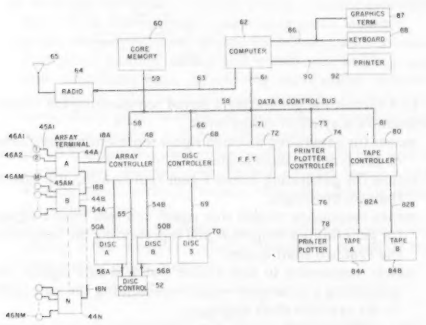
DATA ACQUISITION AND PROCESSING SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena; C. Hewitt Dix, Pasadena, and Donald R. Juiles, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Filed May 7, 1973, Ser. No. 358,076

Int. Cl. G01v *1/28*

U.S. Cl. 235—151.3 **7 Claims**



1. A seismic exploration system comprising:

a. means for generating seismic disturbances in the earth;

b. a plurality of spaced detectors for generating a plurality of analog signals in response to said seismic disturbances after traveling through the earth;

c. means for amplifying said analog signals, adding to each signal a shifting function to form a sum signal and zero-crossing-coding said sum signals and storing said coded signals;

d. means on command from a rotating magnetic disc storage means for sequentially reading out said stored coded signals in the form of a plurality of trains of digital bit signals and transmitting them through a single pair of conductors to said disc storage means;

e. means for storing said trains of digital bit signals on rotating magnetic disc means in first selected spaced relation, the time of read out of said signals being dependent upon the instantaneous position of said disc as it rotates.

3,930,146

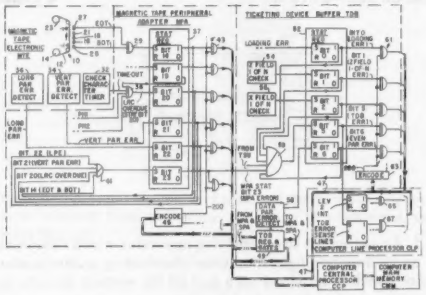
INPUT/OUTPUT CONTROLLER MAINTENANCE ARRANGEMENT FOR A COMMUNICATION SWITCHING SYSTEM

Frank J. Bogacz, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 18, 1974, Ser. No. 434,760

Int. Cl.² G05B *23/02*; G06F *11/04*

U.S. Cl. 235—153 AK **8 Claims**


MAGNETIC TAPE PERIPHERAL ADAPTER MPA
TICKETING DEVICE BUFFER TDB
COMPUTER LINE PROCESSOR CLP
COMPUTER CENTRAL PROCESSOR CCP
COMPUTER MAIN MEMORY CMM

1. In a communication switching system having a central processor with a main memory therefor and having a peripheral adapter unit for transferring information to and from an input/output peripheral device, a device buffer for transferring information between the peripheral adapter and the main memory, a maintenance arrangement comprising:

a plurality of input/output device error detecting units for sensing malfunctions occurring in the input/output peripheral device;

a plurality of adapter bi-stable devices associated with peripheral adapter for generating input/output error signals in response to said peripheral device error detecting units sensing malfunctions;

a plurality of device buffer error detecting units for sensing malfunctions occurring in the device buffer;

a plurality of buffer bi-stable devices associated with the device buffer for generating device buffer error signals in response to said device buffer error detecting units sensing malfunctions occurring in the device buffer;

an error bi-stable device responsive to said adapter bi-stable device and to said buffer bi-stable devices generating their error signals for requesting the services of the central processor for maintenance purposes; and

control means responsive to said error bi-stable device for monitoring said buffer bi-stable devices to determine whether the malfunction occurred in the device buffer and for monitoring subsequently said adapter bi-stable devices if the malfunction did not occur in the device buffer to determine the source of the malfunction.

3,930,147

TIME MULTIPLEXED DIGITAL FILTER

Maurice Georges Bellanger, Antony, and Guy Pierre Lepagnol, Sceaux, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed May 13, 1974, Ser. No. 469,533

Claims priority, application France, May 11, 1973, 73.17164

Int. Cl.² G06F *7/38*

U.S. Cl. 235—156 **9 Claims**

1. A digital filter comprising:

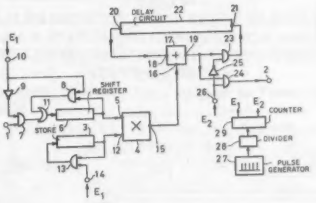
input means for supplying a sequence of signals of predetermined frequency;

coefficient generator means for supplying a sequence of predetermined coefficients;

multiplier means having a first input connected to said input means, and a second input connected to said coefficient

generator means, and an output having an output signal thereon representing the product of the signals on said first and said second inputs;

delay means for producing a predetermined time delay, and having an input and an output;



adding means having a first input connected to said output of said multiplier means and a second input connected to said output of said delay means, and having an output connected to said input of said delay means; and

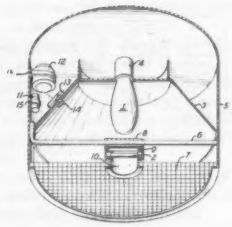
control means for controlling the connection between said output of said adding means and said input of said delay means.

3,930,148

COMPOSITE LIGHT SOURCE

William Gruen, Encino, Calif., assignor to William Gruen, Encino, Calif.

Filed July 22, 1974, Ser. No. 490,470
Int. Cl.² F21S 7/00
U.S. Cl. 240—1 R **2 Claims**



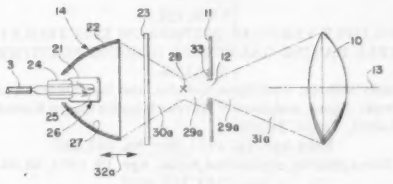
1. A color modulatable composite light source comprising a mercury lamp and an inherently lower efficacy tungsten halogen lamp having a rated voltage, a housing in which said lamps are enclosed and which includes at least a reflector for reflecting the light emitted by said lamps, said tungsten halogen lamp being mounted in said housing directly beneath said mercury lamp and being substantially smaller in physical size than said mercury lamp so that it obscures only a minimal amount of the lumen output of said mercury lamp, means for simultaneously supplying electrical energy to said lamps in respective amounts to cause said mercury lamp to have a substantially greater lumen output than said tungsten halogen lamp, and color modulator means comprising a manually operable means for varying the amount of electrical energy fed to said tungsten halogen lamp to vary the color output of the light source.

3,930,149

VARIABLE INTENSITY DENTAL LIGHT

Park French, Aurora, Ohio, assignor to Sterndent Corporation, Mount Vernon, N.Y.

Filed May 28, 1974, Ser. No. 473,719
Int. Cl.² A61B 1/06
U.S. Cl. 240—41.15 **14 Claims**



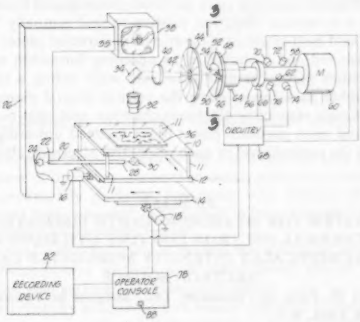
1. A constant color temperature variable intensity lamp, comprising light source means for generating a generally tapered uniform beam of light; gate means for passing at least a portion of such light and capable of precluding passage of a different portion of such light; and focusing means for projecting light passed by said gate means; said gate means being positioned at least proximate one focal plane of said focusing means for substantially focusing an image of the latter at the other focal plane thereof; means for providing relative generally axial movement between said light source means and said gate means, whereby movement of one with respect to the other determines the quantity of light passed by said gate means and hence the intensity of the projected light without varying the uniformity and color temperature thereof.

3,930,150

APPARATUS FOR DETERMINING THE CENTROID OF A LIGHTED HOLE

William F. Marantette, Torrance, Calif., assignor to Digital Systems, Inc., Arcadin, Calif.

Filed Dec. 23, 1974, Ser. No. 536,038
Int. Cl.² G01J 1/20
U.S. Cl. 250—203 R **8 Claims**



1. Apparatus for determining the centroid of a lighted hole comprising:

a. means for supporting a template containing an image of at least one hole, said means being moveable;

b. a photo-sensitive element in the form of a strip, illuminations of said photo-sensitive element resulting in an electrical signal dependent upon the amount of light striking said element;

c. a means for projecting light through a hole in the template so as to strike said photo-sensitive element;

d. means for rotating said photo-sensitive element about an axis; and

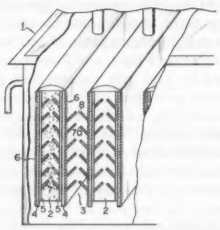
e. circuit means for sampling the resultant electrical signal at at least a first and second rotational position of said photo-sensitive material, and comparing said signals, said circuit means providing a signal for activating means for moving said supporting means if said first and second signals are not equal.

3,930,151

MULTIPLE VERTICAL DIAPHRAGM ELECTROLYTIC CELL HAVING GAS-BUBBLE GUIDING PARTITION PLATES

Hiroshi Shibata; Yoshikazu Kokubu, and Isao Okazaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,295
Claims priority, application Japan, Apr. 19, 1973, 48-44415
Int. Cl.² C25B 9/00
U.S. Cl. 204—258 **11 Claims**



1. In a multiple vertical diaphragm electrolytic cell, the improvement comprising a plurality of electrode chambers, each including two electrodes having mutually facing walls which are disposed on opposite inner sides of respective electrode chambers and a plurality of separate gas-bubble guiding partition plates made of a heat-resistant synthetic resin attached to said mutually facing walls of said electrodes in an upwardly inclined condition with the lower ends thereof in a slightly separated position from said walls and with adjacent heat-resistant synthetic resin partition plates spaced from each other in a vertical direction relative to said mutually facing walls, said heat-resistant synthetic resin partition plates being dimensioned and mounted in an opposing formation so that extremities thereof remote from said walls define a vertical gas-bubble passageway along the vertical central plane position of each respective electrode chamber, said heat-resistant synthetic resin partition plates being inclined upwardly relative to the central level of each respective electrode chamber.

3,930,152

SYSTEM FOR MEASURING EARTH FORMATION THERMAL NEUTRON LIFETIME UTILIZING A HARMONICALLY INTENSITY MODULATED FAST NEUTRON SOURCE

Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

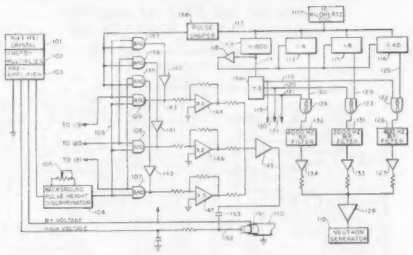
Filed July 17, 1974, Ser. No. 489,335
Int. Cl. G01t 1/16
U.S. Cl. 250—269 **15 Claims**

1. Apparatus for logging earth formations traversed by a fluid filled well borehole to develop a measurement of thermal neutron interaction characteristics of such formations, comprising:

a well logging sonde sized and adapted for passage through a well borehole and having therein;

means for continuously generating a population of fast neutrons for bombarding the media surrounding a well borehole to develop a thermal neutron population in the borehole and surrounding media;

means for harmonically modulating the intensity of fast neutrons at, at least three different modulation frequencies;



means for detecting the thermal neutron population in the vicinity of said sonde as a function of time and for developing signals representative thereof; and

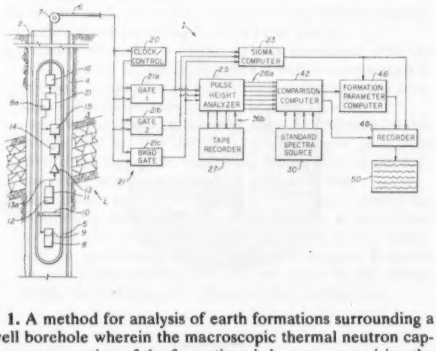
means for combining said representative signals according to predetermined relationships to derive an indication of the thermal neutron decay time of the earth formations in the vicinity of the borehole.

3,930,153

MEASUREMENT OF SUBSURFACE FORMATION LITHOLOGY, INCLUDING COMPOSITION AND FLUIDS, USING CAPTURE GAMMA SPECTROSCOPY

Hubert D. Scott, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,939
Int. Cl.² G01V 5/00
U.S. Cl. 250—270 **52 Claims**



1. A method for analysis of earth formations surrounding a well borehole wherein the macroscopic thermal neutron capture cross-section of the formations is known, comprising the steps of:

a. obtaining standard gamma ray energy spectra of materials postulated to be in formations surrounding a well borehole;

b. bombarding the earth formations in the vicinity of the borehole with fast neutrons which are slowed down and thereafter engage in neutron capture reactions with materials in the vicinity of the borehole;

c. obtaining gamma ray energy spectra of unknown materials surrounding the well borehole;

d. comparing an unknown gamma ray spectrum with a composite weighted mixture of the standard gamma ray spectra to obtain therefrom a quantitative measure of the percentage composition of elements in the vicinity of the borehole; and

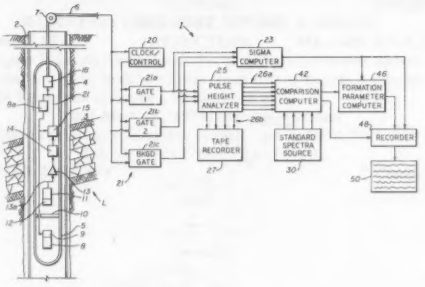
e. obtaining quantitatively the primary formation parameters of the formation from the quantitative measure of percentage composition of elements and the known macroscopic thermal neutron capture cross-section of the formation.

3,930,154

MEASUREMENT OF SUBSURFACE FORMATION LITHOLOGY, INCLUDING COMPOSITION AND FLUIDS, USING GAMMA SPECTROSCOPY AND THERMAL NEUTRON DECAY

Hubert D. Scott, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,940
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **21 Claims**



1. A method for analysis of earth formations surrounding a well borehole comprising the steps of:

a. obtaining standard gamma ray energy spectra of materials postulated to be in formations surrounding a well borehole;

b. bombarding the earth formation with repetitive pulses of fast neutrons which are slowed down and thereafter engage in neutron capture reactions with materials in the viciniity of the borehole;

c. obtaining gamma ray energy spectra of the unknown materials surrounding a well borehole;

d. comparing an unknown gamma ray energy spectrum with a composite weighted mixture of the standard gamma ray spectra to obtain therefrom a quantitative measure of the percentage composition of elements in the vicinity of the borehole;

e. simultaneously obtaining a measure of the macroscopic thermal neutron capture cross section of the earth formation surrounding the borehole; and

f. compensating the unknown gamma ray energy spectra for variations in the thermal neutron capture cross section obtained for the materials present in the formations surrounding the well borehole.

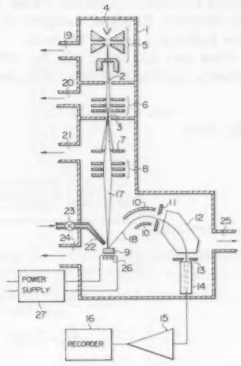
3,930,155

ION MICROPROBE ANALYSER

Ichiro Kanomata, Fuchu; Hiroshi Doi, Ome, and Hifumi Tamura, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1974, Ser. No. 434,061
Claims priority, application Japan, Jan. 19, 1973, 48-7911; Apr. 2, 1973, 48-36742
Int. Cl. H01J *37/00*
U.S. Cl. 250—309 **9 Claims**

1. An ion microprobe analyser comprising an ion gun for emitting a primary ion beam of non-reactive gas, at least one ion lens for focusing said primary ion beam to irradiate a desired analysed spot on the surface of a specimen with said primary ion beam, mass spectrometric means for analysing the mass-to-charge ratio of a secondary ion beam emitted from the specimen due to irradiation with said primary ion beam, means for detecting the result of analysis by said mass spectrometric means, and means for supplying a chemically reactive gas toward the desired analysed spot on the surface of said specimen.

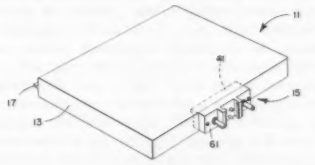


3,930,156

CASSETTE UNIT

Sidney E. Hindell, San Diego, Calif., assignor to Diagnostic Instruments, Inc., San Diego, Calif.

Continuation of Ser. No. 264,247, June 19, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 458,809
Int. Cl.[2] G03B *13/00*
U.S. Cl. 250—315 A **7 Claims**



1. A cassette for ionographic reproduction of images comprising:

a first plate including a first flat electrode carrying a thin sheet of dielectric material smoothly adhered thereto but conveniently peelable therefrom, one surface of said sheet being exposed and adapted to have formed thereon a latent electrostatic image;

a second plate including a second flat electrode having a photoemissive surface, said plates being spaced apart with said surfaces opposing each other;

an electrically nonconductive spacer disposed between the plates to extend around the periphery of the plates at the margins thereof thereby to define a uniform gaseous filled gap between said opposing surfaces;

a connector having a first terminal in electrical contact with the first electrode and a second terminal in electrical contact with the second electrode and adapted to be quick-detachably connected to an electrical potential source; and

quick-releasable means for maintaining said plates and spacer in an assembled relationship but which when released permits them freely and completely to separate, said quick-release means comprising a surrounding pack-

aging envelope of a pliable synthetic resin film material which is conveniently severable.

3,930,157

PYROELECTRIC CAMERA TUBE SYSTEMS

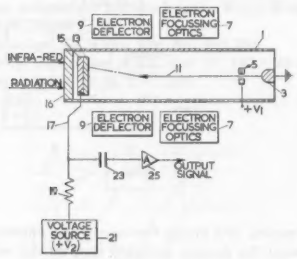
Rex Watton, Malvern, England, assignor to British Secretary of State for Defence, London, England

Filed July 22, 1974, Ser. No. 490,592

Claims priority, application United Kingdom, July 23, 1973, 35040/73

Int. Cl.² H01J *31/49*

U.S. Cl. 250—330 **10 Claims**



1. A pyroelectric camera tube system comprising a pyroelectric target for detecting by the pyroelectric effect thermal electromagnetic radiation incident thereon, means for repetitively scanning an ionic beam across a surface of said target, the product of the electrical resistance R_T and the electrical capacitance C_T of said target when scanned by said ionic beam being in the range from one-half of τ_F to 1,000 times τ_F, where τ_F is the average scanning period at which said means for scanning is capable of scanning said surface, the limits of said range being inclusive, a pick-up electrode in electrical contact with said target, said pickup electrode operating to produce an output signal corresponding to the quantity of pyroelectric charge developed at the part of said surface scanned by said electron beam, an electrical impedance having one end thereof electrically connected to said electrode, and a voltage source connected to the other end of said impedance, said voltage source providing a substantially steady electrical output voltage operative to leak, by conduction through said impedance and through said target to said scanned surface of said target, a quantity of charge of the opposite polarity to said ionic beam to form on said scanned surface a bias charge pedestal having a magnitude independent of said pyroelectric cnarge, said leaked charge acting as a quenching charge on said scanned surface capable of quenching in said average scanning period any excess charge left on said scanned surface from said ionic beam.

3,930,158

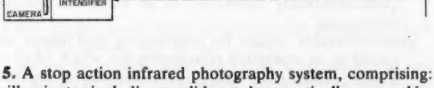
INFRARED PHOTOGRAPHY

Evan P. Chicklis, Nashua, N.H., and John D. Kuppenheimer, Jr., Tewksbury, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 4, 1974, Ser. No. 520,584

Int. Cl.² H01J *31/49*

U.S. Cl. 250—330 **5 Claims**



5. A stop action infrared photography system, comprising: an illuminator including a solid state laser optically pumped by an incoherent source of energy and operated at a wavelength of between 0.8 to 0.9 microns;

an image intensifier sensitive at the wavelength of the illuminator and disposed to receive reflected energy from a target on the photocathode thereof; and

a photographic film arranged to receive an image from the phosphor screen of said image intensifier.

3,930,159

DEVICE FOR MEASURING THE COOLING TIME OF WELDS

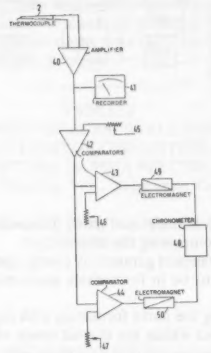
Freddy Antoine Marquet, Beaufays, Belgium, assignor to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie, Brussels, Belgium

Continuation-in-part of Ser. No. 494,919, Aug. 5, 1974, abandoned. This application Aug. 12, 1974, Ser. No. 496,738

Claims priority, application Belgium, Aug. 10, 1973, 803524

Int. Cl.² G01K *7/02*

U.S. Cl. 250—338 **11 Claims**



1. A device for measuring the cooling time of a weld, comprising: a holder in the form of a pistol having a barrel and a butt; a thermocouple housed in the barrel and being slidable along a longitudinal axis of the barrel so as to extend from the end of the barrel; a photo-electric cell sensitive to thermal radiation from the fused metal of a weld, the cell being mounted on the holder and having an axis of sight which intersects the said longitudinal axis in front of the barrel; means for projecting the thermocouple partially from the barrel along the said longitudinal axis; a first electronic control circuit adapted to actuate the said projecting means when the temperature corresponding to the thermal radiation sensed by the cell reaches a predetermined limit, the control circuit being housed in the butt; and a second electronic control circuit, which is connected to an output of the thermocouple and which is adapted to start and stop a time meter at respective upper and lower given temperature values as measured by the thermocouple.

3,930,160

GROOVED WINDOWS FOR SCINTILLATION CRYSTALS AND LIGHT PIPES OF HIGH REFRACTIVE INDEX

Carl F. Swinehart, University Heights, Ohio, assignor to Kewanee Oil Company, Bryn Mawr, Pa.

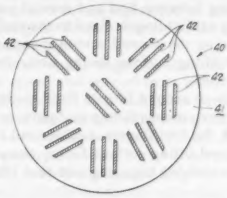
Filed Feb. 11, 1974, Ser. No. 441,584

Int. Cl. C01t *1/20*

U.S. Cl. 250—361 **9 Claims**

1. In a crystal for use with light collection means coupled thereto, the improvement comprising a transparent scintilla-

tion crystal having at least one shallow groove or depression in the crystal light transmitting surface through which light



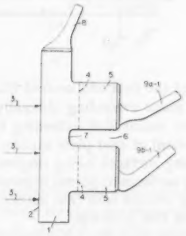
generated within the crystal is transmitted to the light collection means.

3,930,161

RADIATION DETECTOR HAVING A MOSAIC STRUCTURE

Jacques Francois Ameurlaine, Paris, and Michel Benoit Sirieix, Jouy-en-Josas, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,468
Claims priority, application France, Apr. 4, 1973, 73.12067
Int. Cl.² G01T *1/22*; G01J *1/00*
U.S. Cl. 250—370 **7 Claims**



1. An infra-red radiation detector comprising an n-type semi-conductor block on which are disposed in the form of projections small elementary p-type semi-conductor blocks, thereby creating a matricial network of elementary junctions, wherein the sensitive face of said detector is the free face of said n-type semi-conductor block which is parallel to the plane of the elementary junctions.

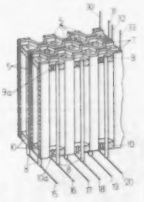
3,930,162

MATRIX-FORM RADIATION IMAGE CONVERTER

Karl-Hans Reiss, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 5, 1973, Ser. No. 367,144
Claims priority, application Germany, June 21, 1972, 2230329
Int. Cl. G01t *1/18*
U.S. Cl. 250—385 **6 Claims**

1. A proportional radiation image converter for making visible images produced by gamma rays, comprising a container having a ray inlet surface and, inside the container, in combination, a matrix of detector cells, said matrix comprising two groups of conductors, the conductors of one group being anode members and spaced from the conductors of the other group which are cathode members, the space between the groups being filled with gas having substantially a pressure of 10 at., the conductors in the groups forming rows with rows of the one group extending at an angle to the rows of the other group, the conductive member of the group belonging to cathode members substantially encircling one of the conductors of the other of said groups, and thus forming one of said cells extending substantially perpendicularly to the ray inlet surface, and means for separately detecting an electrical signal from each of said conductors and for indicating the cell address of a gas-ionizing incident in the detector; said cathode



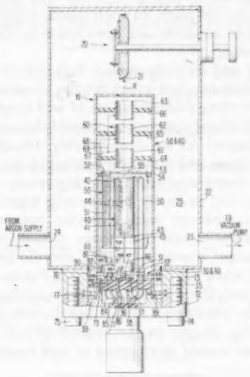
members comprising electrically conductive strips which are insulated from one another; said anode members comprising electrically conductive rods disposed between and insulated from said cathode members.

3,930,163

ION BEAM APPARATUS WITH SEPARATELY REPLACEABLE ELEMENTS

Robert L. Gerlach, Los Altos, and George Rossini, Mountain View, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 22, 1974, Ser. No. 453,750
Int. Cl.² G01K *1/08*
U.S. Cl. 250—398 **18 Claims**

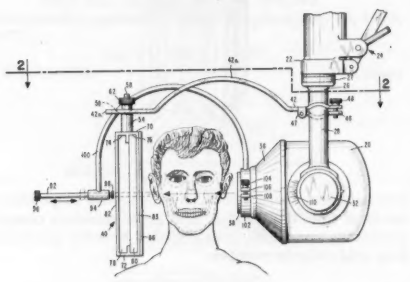


1. An ion beam source comprising an electron emitter, a grid structure maintainable at an electrical potential to attract electrons from said emitter toward the vicinity of said grid structure for collision with ionizable gas atoms in the vicinity of said grid structure thereby providing ions, said grid structure comprising a refractory metal mesh, means for extracting said ions from the vicinity of said grid structure, and means for forming said ions into an ion beam, said electron emitter and said grid structure being mounted on a first assembly member and forming therewith a first assembly unit, said ion extracting means and said ion beam forming means being mounted on a second assembly member and forming therewith a second assembly unit, said second assembly member being demountably secured relative to said first assembly member, and said electron emitter being demountably secured to said first assembly member, whereby said second assembly unit is insertable and removable separately from said first assembly unit and said electron emitter is insertable and removable as an individual unit.

3,930,164
DEVICE FOR USE WITH X-RAY MACHINES

Albert D. Alexander, 3304 Sleepy Hollow Road, Falls Church, Va. 22044

Filed June 28, 1974, Ser. No. 484,066
Int. Cl.² G03B 41/16
U.S. Cl. 250—468 10 Claims



1. A device for use in combination with a projector suspending means and projector cone of an x-ray machine for locating and taking an x-ray picture of a specific portion of a patient's head comprising:

a. an open-ended cassette frame adapted to be adjustably spaced on and vertically disposed in relation to the centerline of said projection cone of said projector, said frame adapted to be demountably attachable by arm means to said suspending means for said projector,

b. said frame comprising guide means for carrying at least one cassette film plate, an open space central section, and shield means adjacent said open space on the inward side of said frame,

c. centering and locating means disposed on the outward side of said frame and adapted to be aligned with and for movement along said centerline of said cone and through the center of said open space of said frame, said centering means adapted to be demountably attachable to said projector cone and movable with said cone,

whereby said frame and said centering means are movable both vertically and pivotally horizontally together with said projector, and whereby said centering means is movable through the center of said open space of said frame for location and alignment contact with said specific portion of said patient's head when the head is disposed between said frame and said projector, thereby centering and aligning said specific head portion for taking an x-ray picture thereof, upon removal of said centering means, on the portion of said cassette film plate positioned in said open space of said frame.

3,930,165
CASSETTE

Alfred Robinson; Joseph S. Schatz, both of Brooklyn, N.Y., and Leonhard Katz, Winchester, Mass., assignors to U. S. Radium Corporation, Morristown, N.J.

Filed Oct. 21, 1974, Ser. No. 516,490
Int. Cl.² G01N 21/34
U.S. Cl. 250—480 13 Claims

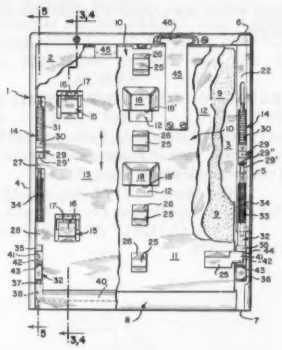
1. In a film cassette having a front and back wall and edge walls connecting three edges of the front and back walls together leaving an opening at one edge wall, first intensifying screen means disposed adjacent the inner surface of said back wall, second intensifying screen means disposed in opposed facing relation to said first screen means, and means for mounting said second screen means for movement toward and away from said first screen means, the improvement comprising:

a. plate means disposed between the second screen means and the front wall;

b. means for mounting said plate means in said housing at a fixed distance from said first screen means and for sliding movement toward and away from one edge wall of the housing between first and second positions;

c. a plurality of first fingers fixed to the surface of said plate means facing the second screen means with each finger having a lifting surface facing away from said second screen means;

d. a plurality of second fingers fixed to the surface of said second screen means facing said plate means for cooperating with the first fingers, said second fingers each having a second lifting surface facing away from said plate means for slidably engaging said first lifting surfaces;



e. at least one of the first and second lifting surfaces being inclined in a plane extending obliquely to said plate and second screen means and extending in the direction of sliding movement of said plate means;

f. said first lifting surfaces being disposed relative to said second lifting surfaces to permit movement of said second screen means toward said first screen means when said plate is in said first position;

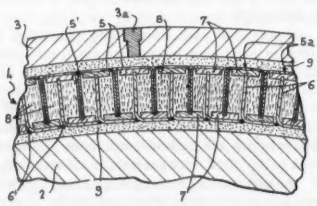
g. said first lifting surfaces engaging said second lifting surfaces to move said second screen means away from the first screen means as said plate is slid from said first position to said second position; and

h. means for pressing said second screen means toward said first screen means when said plate is in said first position.

3,930,166
PACKAGE FOR TRANSPORTING OR ENCLOSING RADIOACTIVE MATERIALS

Camille Bochard, Lyon, France, assignor to Robatel S.L.P.I., Genas, France

Filed Dec. 14, 1973, Ser. No. 424,720
Int. Cl. G21f 3/00, 5/00
U.S. Cl. 250—506 16 Claims



1. Packaging for enclosing and transporting radio-active material of the type including a material container surrounded

by an anti-radiation shield located within a protective metal jacket whose inner wall is spaced from the outer wall of the shield to leave an annular space between said walls for housing an improved protective device operative to insulate the container against heat generated externally of the packaging, the improvement comprising:

a. first and second metal rings concentrically disposed in said annular space and spaced from each other, the first ring being disposed in heat conductive relationship with said jacket and the second ring being disposed in heat conductive relationship with said shield:

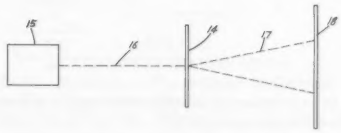
b. radially inwardly extending vanes fixed to the first ring and extending toward the second ring without contacting the latter, and radially outwardly extending vanes fixed to the second ring and extending toward the first ring without contacting the latter, the radially inwardly extending vanes alternating with the radially outwardly extending vanes; and

c. endothermic insulating material filling the spaces between the adjacent vanes.

3,930,167
IN-LINE PRODUCTION CONTROL OF POLYMERIC FILM

Chih C. Hsiao, St. Paul, Minn., assignor to The Reagents of the University of Minnesota, Minneapolis, Minn.

Filed May 4, 1973, Ser. No. 357,105
Int. Cl.² G01N *21/32*
U.S. Cl. 250—572 **27 Claims**



1. A method of controlling the production of a light pervious product comprising moving the material from which said product is to be made along a pre-determined path of travel, treating said material with at least one variable means the variation of which changes the character of the final end product,

transmitting a beam of light through the in-process material, causing diffraction of said light,

recording the characteristics of the diffracted beams after passage through said material,

comparing the recorded characteristics with the previously determined standard diffracted light characteristics of a control sample,

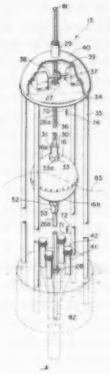
and changing said variable means in response to any differences in the character of the in-process diffracted beams and the control sample diffracted beams to cause the inprocess material to become more like said control sample.

3,930,168
WAVE-ACTION POWER APPARATUS

Michael G. Tornabene, 462 - 7th Ave., New York, N.Y. 10018

Continuation-in-part of Ser. No. 428,349, Dec. 26, 1973, and a continuation-in-part of Ser. No. 432,211, Jan. 10, 1974. This application Apr. 1, 1974, Ser. No. 457,075
Int. Cl.² F03B *13/10*
U.S. Cl. 290—53 **22 Claims**

1. A wave-energy device comprising in combination: a lever means having a float-mounting portion thereof positioned uprightly; a float means mounted rotatably in a substantially horizontal plane on said float-mounting portion for free-roation there-around such that water current contact with the float means in a manner which would produce a torque thereon is rotatable of the float means thereby obviating twisting torque on the lever means; a mass means of predetermined dense mass sufficiently to impart a predetermined high degree of momentum to upward and downward actions of the lever means and the float means being adapted such that overall mass is substantially greater than for a float means devoid of

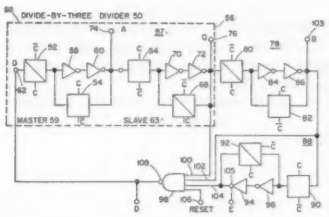


excess mass, the float means being of predetermined water displacement volume sufficiently to negate by water displacement disproportionate weight of the mass means whereby the float is positioned in a partially submerged floating state; and said float means and said mass means jointly including mass-attaching means for mounting said mass to said float means.

3,930,169
CMOS ODD MULTIPLE REPETITION RATE DIVIDER CIRCUIT

Harry A. Kuhn, Jr., Phoeniz, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 27, 1973, Ser. No. 402,491
Int. Cl.² H03K *23/08, 21/36, 19/08, 3/33*
U.S. Cl. 307—225 C **9 Claims**



1. An odd-multiple divider circuit employing flip-flops and having a minimum number of circuit components each flip-flop including a master and a slave section, each master and each slave section being comprised of a first and a second Complementary-Metal-Oxide-Semiconductor-Field-Effect-Transistor (CMOSFET) transmission gate and a pair of series connected CMOSFET inverters, the first CMOSFET transmission gate of each master and slave section having an output terminal connected to the input terminal of the pair of series connected CMOSFET inverters thereof, the second CMOSFET transmission gate of each master and slave section providing a feedback path from the output terminal of the pair of series connected CMOSFET inverters to the input terminal of the pair of series connected CMOSFET inverters, the output

terminal of the series connected CMOSFET inverters of each master section of each flip-flop being connected to the input terminal of the first CMOSFET transmission gate of each slave section of the flip-flop, each of the CMOSFET transmission gates of each master and slave section having control terminals adapted to receive a clock signal having a pair of periodic and complementary binary signals, the divider circuit including in combination:

a first one of the flip-flops having an input terminals and a single output terminal, said input terminal being connected to the input terminal of the first CMOSFET transmission gate of the master section of said first flip-flop, said single output terminal being connected to the output terminal of the pair of series connected CMOSFET inverters of the slave section of said first flip-flop;

a second one of the flip-flops having an input terminal and first and second output terminals, said input terminal being connected to the input of the first CMOSFET transmission gate of the master section of said second flip-flop, said input terminal also being connected to said single output terminal of said first flip-flop, said first output terminal being connected to the output terminal of the pair of series connected CMOSFET inverters of the master section of said second flip-flop, said second output terminal being connected to the output terminal of the pair of series connected CMOSFET inverters of the slave section of said second flip-flop;

the operation of said first and second flip-flops thereby being continuously dependent on each cycle of the clock signal to transfer the logic state at the input terminals thereof to the output terminals thereof regardless of the logic state at the input terminals thereof;

gate means having first, second and third input terminals and an output terminal, said first input terminal being connected to said output terminal of said first flip-flop, said second input terminal being connected to said second output terminal of said second flip-flop;

first circuit means coupling said output terminal of said gate means to said input terminal of said first flip-flop; and

second circuit means coupling said first output terminal of said second flip-flop to said third input terminal of said gate means for rendering the divider circuit suitable to divide the frequency of the clock signal by an odd-multiple integer, the odd-multiple divider circuit having a minimum number of circuit components.

3,930,170

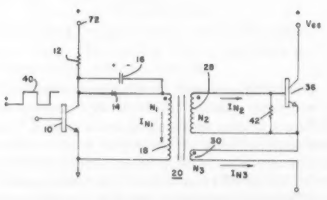
SWITCHING TRANSISTOR DRIVE APPARATUS

James H. Burens, Westlake Village, Calif., and Kenneth A. Wallace, Columbus, Ohio, assignors to North Electric Company, Galion, Ohio

Filed June 4, 1974, Ser. No. 476,254

Int. Cl.[2] H03K *17/60*

U.S. Cl. 307—254 **7 Claims**



1. In a switching transistor drive apparatus, a first transistor having a base, a collector and an emitter, a second transistor having a base, a collector and an emitter, a transformer having a primary **N1**, and secondaries **N2** and **N3** forming windings of a larger and a smaller number of turns, respectively, for the transformer, first resistance means connecting a source to the collector of the first transistor, an impedance network connecting the collector of the first transistor to a terminal of the primary **N1**, the other terminal of the primary **N1** connected to the emitter of the first transistor and to a return connection of said source, a common terminal for secondaries **N1** and **N2** connected to the emitter of the second transistor, the secondaries **N2** and **N3** wound and connected in series aiding relationship so that said secondary of larger number of turns has its other terminal connected to the base of the second transistor and so that the secondary of smaller number of turns has its terminal connected to a load.

3,930,171

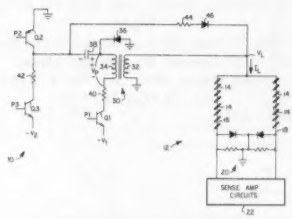
LOW POWER, FAST RISE TIME CURRENT DRIVER FOR INDUCTIVE LOAD

Ricardo M. Takahashi, Canoga Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed July 15, 1974, Ser. No. 488,315

Int. Cl.[2] H03K *17/64, 17/16, 17/20;* **G11C** *11/02*

U.S. Cl. 307—270 **13 Claims**



1. A current driver for driving a sense-inhibit line of a magnetic core memory comprising:

a transformer having a primary winding with first and second terminals and a secondary winding which is connectable to drive a sense-inhibit line;

a first switch connected in series between the first terminal of the primary winding and a voltage source to impress a voltage across the primary winding on command;

a capacitor having a first terminal and a second terminal coupled to the second terminal of the primary winding;

a diode having a first terminal coupled to ground and a second terminal coupled to the second terminal of the primary winding and the second terminal of the capacitor;

a second switch coupled between the first terminal of the capacitor and a voltage supply; and

means for selectively charging the capacitor and closing the second switch whereby the charged capacitor increases the voltage impressed across the primary winding and discharges through the primary winding to a voltage which has substantially no effect upon the voltage impressed across the primary winding.

3,930,172

INPUT SUPPLY INDEPENDENT CIRCUIT

Robert C. Dobkin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 6, 1974, Ser. No. 521,363

Int. Cl.[2] G05F *1/56*

U.S. Cl. 307—297 **16 Claims**

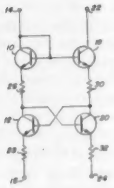
1. A circuit disposed for connection to an input supply for providing an output which is independent of that supply, comprising

a plurality of transistors, and

means responsive to the input supply for generating a base-emitter voltage on all of said transistors,

the base-emitter junctions of said transistors being connected serially in a loop with one another, such that the

summation of the base-emitter voltages of said transistors is developed as an output voltage between the base-emitter junctions of two adjacent ones of said transistors in said loop,



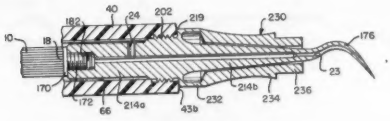
the collector currents of any of said transistors having their collector-emitter circuits connected in series being equal to one another and their base-emitter voltages opposing one another around said loop, such that said summation of the base-emitter voltages is independent of the collector currents of said transistors and only proportional to the difference of the emitter areas of said transistors.

3,930,173

ULTRASONIC TRANSDUCERS

Anton Banko, Brooklyn, N.Y., assignor to Surgical Design Corporation, Long Island City, N.Y.

Continuation of Ser. No. 153,380, June 15, 1971. This application Nov. 5, 1973, Ser. No. 412,767
Int. Cl.[2] H01L *41/00*
U.S. Cl. 310—26 **48 Claims**



1. An ultrasonic energy transducer for producing vibrational wave energy at a substantially predetermined frequency comprising:

a. magnetostrictive means for converting electrical energy into vibrational energy,

b. a vibrating structure for producing motion including;

an acoustic impedance transformer of metallic material which is substantially one half wavelength long at said predetermined frequency directly connected at one end thereof to one end of said magnetostrictive means, said transformer including a working tool at the other end for producing motion,

an outer shell of metallic material of a length substantially one quarter wavelength at said predetermined frequency which is spaced from and surrounds a portion of said transformer,

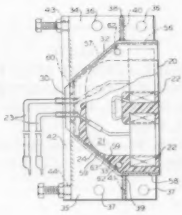
and means directly connecting said shell to said transformer in metal to metal contact so that energy can be transferred from the transformer to said shell, said shell thereby forming a part of the vibrating structure and affecting the characteristics of the vibrational energy of said structure.

3,930,174

STATOR AND ARMATURE FOR A VIBRATING MOTOR

Ming K. Shieh, Westerville, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 8, 1974, Ser. No. 458,653
Int. Cl.[2] H02K *33/02*
U.S. Cl. 310—29 **2 Claims**



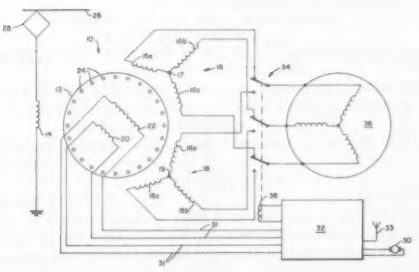
1. A vibrating motor comprising: a stator housing having an open end lying generally in a plane; a stator disposed in the stator housing and having an end flush with the open end of said stator housing; means for providing periodic electrical excitation of the stator; an armature housing movably connected to the stator housing and having an open end lying generally in a plane parallel to and spaced from the open end of said stator housing; and an armature disposed in the armature housing and having an end flush with the open end of said armature housing opposite the end of the stator such that periodic excitation of the stator produces a reciprocating movement of the armature and armature housing due to the periodic magnetic attraction and release of said armature, wherein both the stator and the armature are held in their respective housings by a hardened encapsulating material filling their respective housing flush to the open ends and surrounding all of the stator and armature except for their opposed polar ends and further including pieces of expanded metal secured to the walls of said housings to form an anchor for the encapsulating material.

3,930,175

DYNAMOELECTRIC MACHINE

Keith M. Chirgwin, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sept. 10, 1973, Ser. No. 396,043
Int. Cl.[2] H02M *5/32*
U.S. Cl. 310—160 **18 Claims**



1. Dynamoelectric apparatus comprising:

a. rotor and stator members;

b. magnetic excitation means on each of said rotor and stator members for operating said rotor at a predetermined synchronous speed in response to the application

of single phase alternating current power to one of said magnetic excitation means; and

c. an alternating current output winding means comprising an electrically closed loop coil disposed on said stator member and arranged to provide multi-phase alternating current of at least two frequencies at two pairs of output terminals connected to said closed loop coil at four different locations thereon so as to define two electrically different pole arrangements of said output winding means.

3,930,176

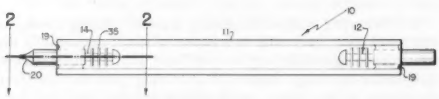
INNER ELECTRODE-SUPPORT SEAL FOR A GASEOUS DISCHARGE FLASHTUBE

C. Richard Panico, Medford, Mass., assignor to Xenon Corporation, Medford, Mass.

Filed Feb. 14, 1974, Ser. No. 442,630

Int. Cl.² H01J *61/36, 61/52*

U.S. Cl. 313—220 **7 Claims**



1. A gaseous discharge flashtube in which the discharge electrode assemblies are soldered to the envelope of the flashtube comprising:

a. A transparent heat-resistant envelope having cylindrical terminal portions;

b. a discharge electrode assembly mounted in each said cylindrical terminal portion (with all metallic portions of each said assembly within the perimeter of the extended internal circumference), said discharge electrode assembly assembled from metal components having a total maximum outside diameter smaller than the internal diameter of the respective cylindrical terminal portions; and,

c. a layer of metallic solder surrounding a supporting portion of each electrode assembly between the electrode assembly and the inner surface of said envelope fused to both said electrode assembly and said envelope so as to sealingly support said electrode assembly in said envelope.

3,930,177

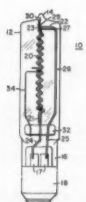
SINGLE-ENDED INCANDESCENT LAMP HAVING A SIMPLIFIED FILAMENT-MOUNT

Jack Martin, Paramus, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1972, Ser. No. 260,084

Int. Cl.² H01J *1/15, 1/88*

U.S. Cl. 313—271 **4 Claims**



1. In a single-ended electric incandescent lamp having a tubular envelope that is terminated at one end by a hollow tip and is closed at its other end by a press seal, said hollow tip being substantially aligned with the axis of the envelope, a mount structure comprising;

an elongated coiled-coil filament of continuously-wound refractory metal wire having a singly-coiled leg at each end that constitutes an integral part of the filament as wound and thus consists of a plurality of continuously-wound primary turns, one of said legs having a primary turn that is bent from its as-wound configuration and defines an opening in the leg that is located a predetermined distance from the free end of said leg, and

means suspending said coiled-coil filament in longitudinal position within the envelope comprising a pair of rigid lead wires of unequal length that are anchored in said press seal and are secured to the legs of said filament,

the longer of said pair of lead wires being disposed alongside of but spaced from said filament and being terminated by a generally L-shaped hook portion that extends through the filament leg with the bent primary turn, through the opening in said leg defined by said bent primary turn and into the hollow tip of the envelope,

the part of said longer lead wire that extends alongside the filament being substantially straight, offset toward the envelope wall, and joined to the generally L-shaped hook portion of said longer lead wire by a sharp angular bend, and

the end of the filament leg which is secured to said longer lead wire being seated against said sharp angular bend so that said bend thus serves as a stop for positioning the filament leg on said longer lead wire.

3,930,178

ELECTRICAL INCANDESCENT FILAMENT DEVICES

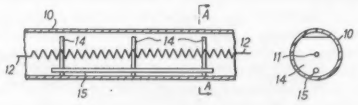
James Richard Coaton, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed July 5, 1974, Ser. No. 485,778

Claims priority, application United Kingdom, July 10, 1973, 32729/73

Int. Cl.² H01J *1/90, 19/44*

U.S. Cl. 313—275 **5 Claims**



1. In a linear incandescent filament electrical device having an elongated tubular envelope containing a filament extending along the tube parallel to the central axis thereof and supported at intervals by supports which engage the wall of the envelope, the improvement wherein the supports are plates of electrically-insulating, ceramic material heat-shrunk onto the filament to form a mechanical bond therewith, each plate having edges which fit closely against the inside surface of the envelope and are of sufficient width to prevent skewing of the plate relative to the axis of the envelope.

3,930,179

GRID-TYPE ELECTRONIC TUBE

Pierre Gerlach, and Roger Hoet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 17, 1974, Ser. No. 533,715

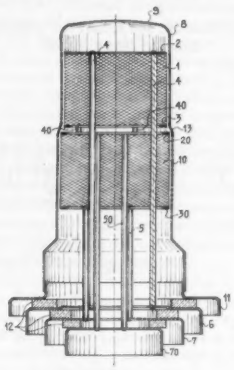
Claims priority, application France, Dec. 21, 1973, 73.46038

Int. Cl.² H01J *1/46, 21/20*

U.S. Cl. 313—296 **1 Claim**

1. An electronic tube with cylindrical electrodes, comprising a cathode, one or more grids, and an anode, consisting of cylinders arranged around a common axis, characterised in that said cathode is constituted by at least two separate sec-

tions of different diameters; and in that at least the first of said grids, that is to say that which is closest to said cathode, is



made up of cylindrical sections of different diameters connected together by a non-cylindrical surface at the level of the splits between said sections.

3,930,180

COLOR CATHODE RAY TUBE MAGNETIC POLE PIECE SUPPORT STRUCTURE

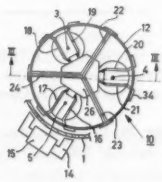
Johannes Aloysius van Leeuwen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,388

Claims priority, application Netherlands, May 21, 1973, 7307040

Int. Cl.² H01J *29/51, 29/02*

U.S. Cl. 313—417 **3 Claims**



1. A cathode-ray tube for displaying color pictures comprising an evacuated envelope and, within said envelope, means to generate a plurality of electron beams, a display screen having a plurality of regions luminescing in different colors, a color selection electrode having a plurality of apertures to assign each electron beam to luminescent regions of one color, convergence means including a cylindrical sleeve, a plurality of pairs of ferromagnetic pole shoes secured to said sleeve and extending radially inwards to converge the electron beams toward the display screen, means to magnetically screen said pairs of pole shoes from each other, and spacing means abutting against the free ends of each pair of said pole shoes to fix the space therebetween.

3,930,181

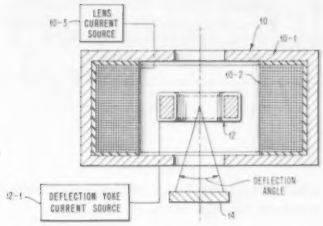
LENS AND DEFLECTION UNIT ARRANGEMENT FOR ELECTRON BEAM COLUMNS

Hans Christian Pfeiffer, Ridgefield, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,410

Int. Cl.² H01J *29/76, 29/70*

U.S. Cl. 313—421 **4 Claims**



1. In an electron beam column deflection system of the type wherein an electron beam is generated, focussed, and deflected on a target, a focussing and deflection unit comprising: means for producing a magnetic lens in the path of said electron beam for focussing said electron beam onto a target, said magnetic lens producing means including a field generating coil and at least two pole pieces forming an air gap for producing static magnetic field lines which form a rotationally symmetrical field distribution having a field maximum in said air gap for focussing said electron beam,

and a magnetic deflection yoke including sinusoidally distributed windings for producing a dynamic magnetic field, said magnetic deflection yoke being located inside said longitudinal magnetic field lines of said air gap of said magnetic lens means at the maximum of said symmetrical field distribution wherein said dynamic magnetic field and said static magnetic field are superimposed, for deflecting said electron beam on said target wherein the working distance between said magnetic lens and said target is designated *b*, the working distance between said yoke and target is designated *b'*, and wherein said yoke is located inside said magnetic lens at a position wherein $b = b'$ such that said yoke is located at the maximum of said symmetrical field distribution produced by said pole pieces of said magnetic lens.

3,930,182

TRAVELING-WAVE TUBE HAVING IMPROVED ELECTRON COLLECTOR

Jork Bretting, Thalfingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 25, 1974, Ser. No. 483,074

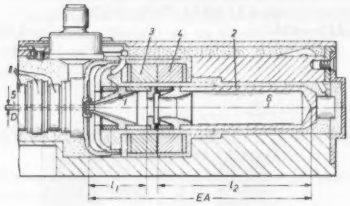
Claims priority, application Germany, June 30, 1973, 2333441

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **11 Claims**

1. In a traveling-wave tube composed of a ppm electron beam focusing device and an electron collector disposed adjacent the focusing device and provided with two collector electrode arrangements disposed to enclose the electron beam over part of its path, said arrangements being spaced from one another by a transition region and being arranged in succession along the axis of the beam in the collector, the two arrangements being electrically insulated from one another, the improvement wherein said collector further comprises additional magnetic focusing lens field producing means disposed

in the transition region between said two collector electrode arrangements and producing a concentrating field which refo-



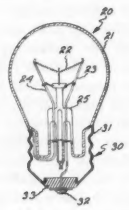
cuses the electrons in the beam in the region between said collector electrode arrangements.

3,930,183

INCANDESCENT LAMPS HAVING PROTECTION AGAINST VOLTAGE SURGES

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,897
Int. Cl.² H01K *1/62*
U.S. Cl. 315—71 **11 Claims**



1. A voltage surge protected incandescent lamp comprising: a filament;

an envelope for containing said filament in an oxidizing agent excluding atmosphere; and

polycrystalline varistor means connected electrically in parallel with said filament for shunting voltage surges to protect said filament therefrom.

11. A surge protective device adapted to be inserted in a lamp socket comprising:

a body of polycrystalline varistor material having a pair of substantially parallel opposed faces and a void in said body extending from a first of said faces to a second of said faces;

first conductor means connected to said first face for providing electrical connection between said first face and a center contact of a lamp socket;

a second conductor means connected to said first conductor means and traversing said void for providing electrical connection between said first conductor means and a protected device; and

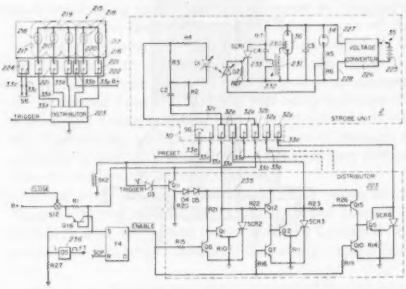
third conductor means connected to said second face for providing electrical connection between said second face and a shell contact of said lamp socket.

3,930,184

ELECTRONIC FLASH COUPLING SYSTEM FOR SEQUENTIAL FLASHBULB FIRING CIRCUIT

Conrad H. Biber, Needham, and Edwin K. Shenk, Littleton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1973, Ser. No. 426,967
Int. Cl.² H05B *39/00*
U.S. Cl. 315—241 P **14 Claims**



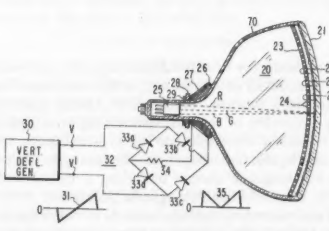
1. An electronic flash unit for use with a camera having an accessory connector adapted to receive at least one flashlamp and having terminals adapted to be supplied with current for firing a flashlamp, said electronic flash unit comprising a triggerable gas discharge tube, means for supplying electrical energy to said tube to cause said tube to produce a flash of light when triggered, trigger circuit means connected to said tube and responsive to an applied signal to trigger said tube, and a signal generating impedance network having input terminals adapted to be connected to the current supply terminals of the camera, said network comprising a resistance approximating the resistance of an unfired flashlamp connected in series with a capacitor between said input terminals, whereby current supplied to said input terminals flows in a pulse that falls in amplitude as said capacitor is charged, simulating the impedance characteristics of a flashlamp as it is fired, said impedance network further comprising means responsive to the flow of current through said capacitor to apply a signal to said trigger circuit means.

3,930,185

DISPLAY SYSTEM WITH SIMPLIFIED CONVERGENCE

William Henry Barkow, Pennsauken, and Josef Gross, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,626
Int. Cl.² H01J *29/70*
U.S. Cl. 315—370 **7 Claims**



1. A display system utilizing simplified convergence, comprising:

a color picture tube including an electron gun assembly for producing three coplanar beams;

static convergence means disposed relative to said picture tube for converging said three beams at the central region of the viewing screen of said picture tube;

a deflection yoke disposed in operating relation about the neck portion of said picture tube, said yoke including vertical and horizontal deflection coils for causing said beams to scan a raster, the winding distribution of said horizontal coils selected for producing negative horizontal isotropic astigmatism for substantially converging vertical lines along the horizontal deflection axis and the winding distribution of said vertical coils selected for causing horizontal lines to be substantially parallel;

means for positioning said yoke relative to said tube for aligning the magnetic deflection field of said yoke relative to said beams for substantially converging horizontal lines at all points on said screen and for substantially converging vertical lines along the horizontal deflection axis;

coil winding portions disposed about the neck portion of said picture tube for producing a quadrupole magnetic deflection field within said neck portion of said tube; and means for energizing said coil winding portions with energy at the vertical scanning rate for converging vertical lines such that said beams are substantially converged at all points on said viewing screen.

3,930,186

PROTECTIVE DEVICE FOR BRUSHLESS DC MOTOR

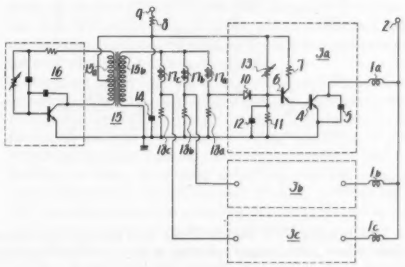
Tetsuo Sekiya, Yokohama, and Atsushi Hienuki, Sendai, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 26, 1974, Ser. No. 483,153

Claims priority, application Japan, June 29, 1973, 48-78240[U]

Int. Cl.² H02H *7/08, 5/04*

U.S. Cl. 317—13 B **6 Claims**



1. A brushless electrical motor including,

a permanent magnet rotor,

a stator rotatably supporting said rotor and a plurality of angularly spaced field windings mounted in said stator, position sensing means mounted on said rotor, a plurality of detecting coils mounted to sense the angular position of said sensing means,

a plurality of electronic switches respectively connected in series with said plurality of field windings and having control electrodes respectively connected to said plurality of detecting coils, first voltage supply terminals connected across said plurality of field windings and electronic switches,

an oscillator,

a transformer having a temperature sensitive magnetic core with its primary winding connected to the output of said oscillator and its secondary connected across each of said detecting coils such that power is sequentially applied to said field windings as said rotor rotates at temperatures below a predetermined temperature but power is disconnected from said field windings by said electronic switches and transformer above said predetermined temperature.

3,930,187

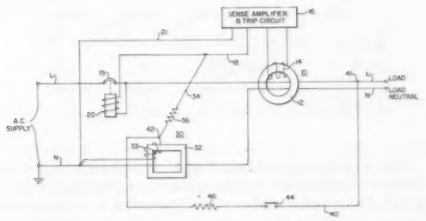
GROUND FAULT INTERRUPTER WITH MEANS PROTECTING AGAINST A GROUNDED NEUTRAL CONDITION AND WITH A TEST CIRCUIT FOR TESTING PERFORMANCE

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1973, Ser. No. 417,659

Int. Cl.² H02H *3/08, 3/28*

U.S. Cl. 317—18 D **4 Claims**



1. Ground fault interrupter apparatus comprising:

a differential current transformer including a magnetic core, a plurality of primary windings on said core, each being one of the line and neutral conductors of an AC electrical distribution system connected between a supply and at least one load, and a secondary sensing winding on said core for sensing current unbalance between currents in said primary windings, said neutral conductor being grounded at a supply terminal thereof;

means responsive to a predetermined sensed signal on said sensing winding to open at least one of said line conductors;

grounded neutral protection means responsive to a fault to ground from the neutral conductor on the load side of the differential transformer to produce a current imbalance in said differential current transformer, said grounded neutral protection means being associated with the neutral conductor on the supply side of said differential current transformer;

test means to test the ability of the apparatus to trip upon occurrence of either line to ground fault conditions or neutral to ground fault conditions, said test means comprising a circuit branch connected from a first point on a line conductor on the load side of said differential current transformer and a second point electrically proximate the neutral conductor on the supply side of said differential current transformer, said circuit branch including a normally open test switch that is closable to cause unbalanced currents in said primary windings;

said grounded neutral protection means comprising an additional transformer having a second magnetic core, a primary winding on said second magnetic core connected between the line and neutral conductors, the neutral conductor of the system being a secondary winding on said second core; and said second point to which said test circuit branch is connected is located adjacent said primary winding of said additional transformer on the side thereof opposite the neutral conductor.

3,930,188
COMPLETELY INSULATED HIGH-VOLTAGE SWITCHING SYSTEM

Willi Olsen, and Manfred Lieske, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

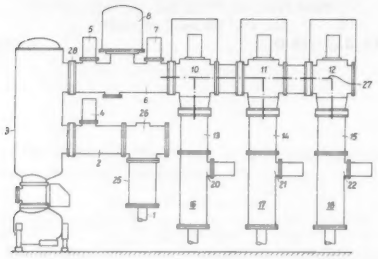
Filed Nov. 2, 1972, Ser. No. 303,011

Claims priority, application Germany, Nov. 12, 1971, 2157102

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H02B *1/20*

U.S. Cl. 317—103 **5 Claims**



1. In a completely insulated high-voltage switching system having a bus-bar fed through a power circuit breaker, a plurality of disconnect switches for connecting a corresponding plurality of branch lines to the bus-bar and for disconnecting the same during a currentless interval caused by a short opening of the power circuit breaker, each of the disconnect switches having first and second connecting conductors, the second connecting conductor being connected to a corresponding one of the branch lines; the improvement comprising the arrangement wherein the first connecting conductor of each of the disconnect switches is directed toward the breaker and is disposed to define a right angle with respect to the second conductor thereof, the first connecting conductors of the disconnect switches being arranged in a straight line to conjointly define the bus-bar, said second connecting conductors being in one plane and the power circuit breaker forming a common plane with the disconnect switches.

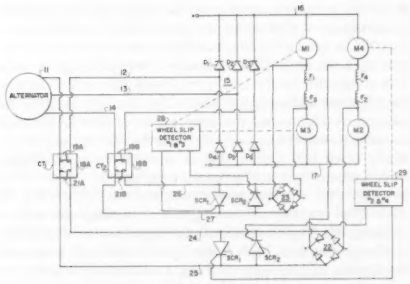
3,930,189
WHEEL SLIP CORRECTION SYSTEM

Russell M. Smith, North East, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 11, 1974, Ser. No. 514,087

Int. Cl.[2] H02P *5/46*

U.S. Cl. 318—52 **11 Claims**



1. A wheel slip control system for electric traction motors employing series-type direct current traction motors having field and armature windings connected in series electrical circuit relationship, power rectifier means and means for supplying alternating current to the power rectifier means, the series-type traction motors being connected across the output from the power rectifier means for the supply of normal excitation direct current thereto, the improvement comprising current transformer means having primary and secondary windings wound on a common core, the primary winding being serially connected in the supply connection between the means for supplying alternating current and the power rectifier means, secondary rectifier means having the output thereof upon excitation coupled to supply auxiliary field current to the field winding of each series-type direct current traction motor in addition to the normal direct current excitation from the power rectifier means, the polarity of the auxiliary field current being such that upon addition to the normal excitation direct current a reduction in the tractive effort of the motor results, and means responsive to the occurrence of a slippage condition for effectively supplying output current from the secondary winding of the current transformer means to the secondary rectifier means to excite the same.

3,930,190
BRUSHLESS DC MOTOR HAVING MULTIPLE STATOR WINDINGS

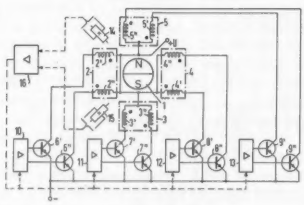
Manfred Liska, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 21, 1974, Ser. No. 481,753

Claims priority, application Germany, June 29, 1973, 2333252

Int. Cl.[2] H02K *23/00*

U.S. Cl. 318—254 **2 Claims**



1. In a brushless d-c motor of the type having a permanent magnet rotor and a stator winding made up of several phase windings with the phase windings Y-connected on one side and provided to one side of a voltage source with the other side of the phase windings coupled through individual power transistors to the other side of the voltage source with each power transistor controlled by a separate control device which is responsive to a rotor position transducer, an improved arrangement for providing such a motor with a power rating in excess of that obtainable through the use of a single transistor in each phase winding the improvement comprising:

a. each phase winding sub-divided into an equal number of winding legs with the winding legs belonging to a phase winding arranged in the stator in two groups of equal size diametrically opposite each other with said two groups electrically connected in such a manner that the magnetic fluxes generated by them act in the same direction;

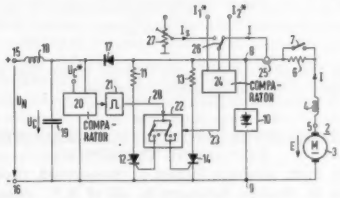
b. the power transistors coupling said phase winding including a separate power transistor coupling each of the winding legs to the other side of the voltage source; and

c. the separate control device for each phase winding coupled to simultaneously energize and deenergize all transistors associated with the legs making up an individual phase winding.

3,930,191
BRAKING CIRCUIT FOR THE MIXED REGENERATIVE AND RESISTANCE BRAKING OF A D-C SERIES MACHINE OPERATED AS A GENERATOR

Peter Loderer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 3, 1974, Ser. No. 475,992
Claims priority, application Germany, June 7, 1973, 2329146
Int. Cl.² H02P 3/14
U.S. Cl. 318—376 **11 Claims**



1. In a braking circuit for the mixed regenerative and resistance braking of a d.c. series machine operating as a generator in which the armature and field windings of said machine are combined with a stabilizing resistor in a series circuit across which is shunted a d.c. control element with a controlled main rectifier and across which is shunted a first braking branch comprising a first braking resistor in series with a first controlled braking rectifier, with the series circuit connected through a return rectifier to a d.c. source which can absorb current at least intermittently, the improvement comprising;

a. means to monitor voltage in the circuit and means responsive thereto to generate firing pulses;

b. at least a second braking branch comprising a second braking resistor having a resistance different from that of the first braking resistor in series with a controlled braking rectifier, said second braking branch coupled in parallel with said first braking branch;

c. a selection circuit having at least three switch positions, selectively closed in response to an input signal and selectively coupling said means generating firing pulses to said first and second controlled braking rectifiers, a first switching position coupling said firing pulses to said first braking rectifier, a second switching position coupling said firing pulses to said second braking rectifier and a third switching position coupling said firing pulses to both said first and second braking rectifiers;

d. means to develop a signal proportional to the actual current in said braking circuit; and

e. control means for providing a control signal to said selection circuit, said control having as inputs the output of said means providing a signal proportional to actual current and first and second predetermined limit values, said control means providing an output closing said first switch when said actual value exceeds said first predetermined value, an output closing said second switch when said actual value is between said two predetermined values and an output closing said third switch when said actual value is greater than said second predetermined value.

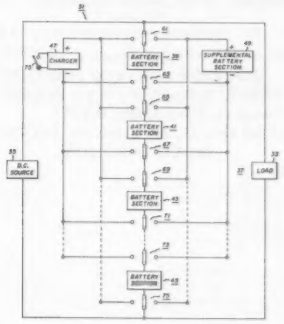
3,930,192
STAND-BY POWER SYSTEM

Leonard R. Dinkler, Gainesville, Fla., assignor to General Electric Company, Columbus, Ohio

Filed May 20, 1974, Ser. No. 471,593
Int. Cl.² H02J 7/00
U.S. Cl. 320—15 **12 Claims**

1. A battery charging apparatus for a high voltage stand-by power system, said system comprising a power source connected in circuit with a load, a supplemental battery section, and a battery of rechargeable cells coupled across said load to provide stand-by power upon the non-functioning of said source, said battery being divisible into a plurality of sections of at least one cell each for charging, said apparatus comprising:

a. charging means for supplying a source of charging current;



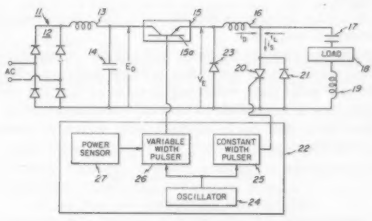
b. switching means, coupled between said charging means and said battery, for sequentially disconnecting one section at a time, each of said plurality of sections from said battery and for connecting said disconnected section to said charger for charging; and

c. a supplemental switching means, coupled between said supplemental section and said battery, for connecting said supplemental section in parallel with each of said plurality of sections, one section at a time.

3,930,193
SCR INVERTER SYSTEMS

William P. Kornrumpf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,988
Int. Cl.² H02M 5/45; G05F 1/44
U.S. Cl. 321—2 **13 Claims**



1. An improved direct current-to-alternating current inverter system comprising:

an SCR inverter adapted to be connected to a load, said inverter including a series resonant load circuit including an inductor, a capacitor and said load with an SCR connected in parallel relationship with said circuit;

a current controlling means having one terminal operatively connected to said SCR inverter and another terminal adapted to be connected to a D.C. voltage source, said means controlling the application of said D.C. voltage source to said SCR inverter;

frequency control means for maintaining the operation of said inverter at a substantially constant frequency, said frequency control means providing variable width gating

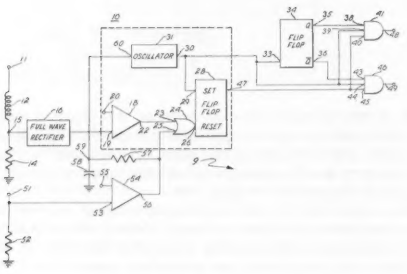
signals to said current controlling means for controlling the duration of time said D.C. voltage source is applied to said SCR inverter and constant width gating signals to said SCR for controlling the conduction of said SCR; and means responsive to inverter system variations for altering the width of said variable width gating signals to ensure reliable SCR commutation as said SCR inverter maintains a substantially constant frequency of operation independently of said system variations.

3,930,194

INVERTER CONTROL CIRCUIT

Loren H. Walker, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,771
Int. Cl.² H02M 1/18
U.S. Cl. 321—11 **9 Claims**



1. A control circuit for a quasi square wave high frequency inverter having solid state switching devices comprising

means sensing instantaneous transformer flux and providing an output proportional thereto,

a first comparator wherein the output of said flux sensing means and a first reference signal are compared and an output is produced when said output proportional to instantaneous transformer flux exceeds said reference signal,

an oscillator having a substantially square wave output at a selected frequency,

means responsive to the outputs of said first comparator and said oscillator for providing turn-on and turn-off signals to said solid state switching devices so that the conduction time is controlled to provide a constant level of peak flux from half cycle to half cycle which is below the saturation level.

3,930,195

ELECTRICAL CIRCUIT HAVING A PAIR OF THYRISTORS

Hideo Iwamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 14, 1974, Ser. No. 479,442
Int. Cl.² H02M 7/515
U.S. Cl. 321—45 C **11 Claims**

1. An electrical circuit comprising:

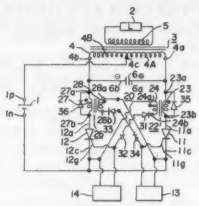
at least one pair of thyristors each having an anode, cathode and gate;

the first thyristor being turned off when turning on the second thyristor and the second thyristor being turned off when turning on the first thyristor;

a pair of transformers;

the first transformer directly applying reverse bias voltage between the gate and cathode of the second thyristor when turning on the first thyristor;

the second transformer directly applying reverse bias voltage between the gate and cathode of the first thyristor when turning on the second thyristor.

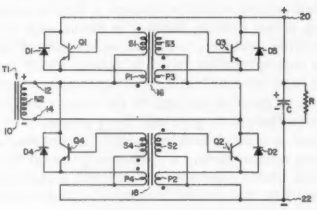


3,930,196

BRIDGE RECTIFIER CIRCUITS USING TRANSISTORS AS RECTIFYING ELEMENTS

John N. Park, Rexford; Robert L. Steigerwald, Scotia, and Loren H. Walker, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 412,342, Nov. 2, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,143
Int. Cl.² H02M 7/217
U.S. Cl. 321—47 **2 Claims**



1. A full wave bridge active rectifying circuit comprising

a pair of input terminals for high frequency alternating-current input voltage with a frequency between 20 and 50 kilohertz, and a pair of output terminals for supplying unidirectional voltage to a load and between which is directly connected a capacitor,

first, second, third, and fourth silicon junction transistors each connected for inverted mode operation and each having an emitter, a base, a collector, and a collector-base junction, a diode connected between the emitter and collector of each transistor with a polarity to conduct in the same direction as the respective transistor, and a plurality of current transformers for controlling said respective transistors having only first, second, third, and fourth pairs of primary and secondary windings,

said first transistor having the collector thereof connected to one output terminal, one end of said first pair of primary and secondary windings being connected together and to one input terminal while the other ends of said first pair of primary and secondary windings are connected respectively to the emitter and base of said first transistor; said second transistor having the collector thereof connected to the other input terminal, one end of said second pair of primary and secondary windings being connected together and to the other output terminal while the other ends of said second pair of primary and secondary windings are connected respectively to the emitter and base of said second transistor; said third transistor having the collector thereof connected to the one input terminal, one end of said third pair of primary and secondary windings being connected together and to the other input terminal while the other ends of said third pair of primary

and secondary windings are connected respectively to the emitter and base of said third transistor; said fourth transistor having the collector thereof connected to the one input terminal, one end of said fourth pair of primary and secondary windings being connected together and to the other output terminal while the other ends of said fourth pair of primary and secondary windings are connected respectively to the emitter and base of said fourth transistor; said transistors further being connecged such that voltage blockage is performable by the collector-base junction of each transistor,

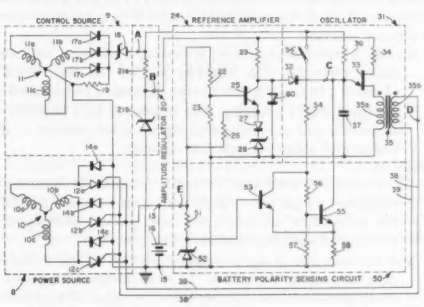
one pair of said first and second pairs of primary and secondary windings and one pair of said third and fourth pairs of primary and secondary windings being magnetically coupled on a current transformer common magnetic core made of ferrite material while the other pair of said first and second pairs of primary and secondary windings and the other pair of said third and fourth pairs of primary and secondary windings are magnetically coupled on another current transformer common magnetic core made of ferrite material.

3,930,197

VOLTAGE REGULATOR SYSTEM

Frederick A. Saylor, Box 231, Leitchs Wharf, Prince Frederick, Md. 20678

Filed Apr. 25, 1974, Ser. No. 464,134
Int. Cl.[2] H02J *7/24*
U.S. Cl. 322—28 **11 Claims**



1. Apparatus for supplying a regulated voltage to a load comprising,

a. permanent magnet alternator means for generating an output voltage,

b. rectifier means coupled between said permanent magnet alternator and said load for rectifying said output voltage, said rectifier means including at least one controllable uni-directional current device having two current carrying electrodes and a control electrode, said device being triggered into conduction upon the application of a control signal of given polarity between said control electrode and one of said two current carrying electrodes,

c. a reference amplifier having a signal input coupled to said load, a bias input coupled to said rectifier means and an output,

d. an oscillator having a signal input coupled to the output of said reference amplifier, a bias input coupled to said rectifier means and an output coupled between the control and one electrode of said uni-directional current device, said oscillator applying pulses to said uni-directional current device having a relative phase corresponding to the magnitude of the voltage across said load, and

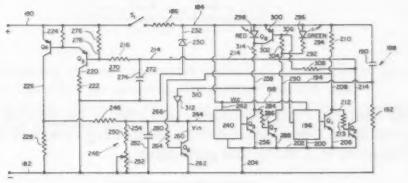
e. a battery polarity sensing circuit including a first resistor and a zener diode connected in series across said load; first and second transistors, said first transistor having its base connected to the junction of said first resistor and zener diode, its collector coupled to said rectifier means and to the base of said second transistor and its emitter to the emitter of said second transistor, the collector-emitter circuit of said second transistor being connected to said oscillator, said battery polarity sensing circuit providing a low impedance path to prevent said oscillator from generating output pulses in the event said load is a battery and has been connected with reverse polarity.

3,930,198

BATTERY TESTER AND CIRCUIT

Richard P. Williamson, Jr., Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 21, 1974, Ser. No. 516,644
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 **17 Claims**



1. Apparatus for evaluating a battery having output terminals of opposed polarity comprising:

contact means for providing electrical communication with said terminals;

load means exhibiting an impedance of predetermined value connectable across said terminals to derive a closed circuit voltage value of said battery;

load switching means actuable to assume a first state applying said load across said terminals through said contact means and a second state electrically isolating said load from said terminals;

evaluating means responsive, when enabled, to said voltage value at said load means exhibiting at least a predetermined value and having a first output condition responsive thereto;

timing means for selectively enabling said evaluating means and responsive to said contact means electrical communication with said terminals for actuating said load switching means to sequentially assume said first and second states to define an interval of sampling for deriving said voltage value; and

indicator means responsive to said evaluating means first output condition for indicating the presence thereof.

3,930,199

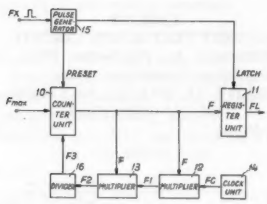
MEANS FOR DETERMINING FREQUENCY

Jaroslav Valis, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 31, 1974, Ser. No. 537,782
Claims priority, application Sweden, Feb. 7, 1974, 7401611
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 D **7 Claims**

1. Means for measuring frequency which comprises a counter unit (10), first and second multipliers (12,13) connected in series with each other, and connected to the counter unit, a sensing unit (15) including means for sensing each pulse in a first unknown pulse train (FX), the frequency (f_x) of which is to be determined, said multipliers (12,13) including means to generate a second pulse train (F2), the frequency of which is proportional to the square of the content (F) of the counter unit (10), the counter unit (10) including means responsive to each pulse in the second pulse train (F2) to reduce the content (F) of the counter unit by a predetermined quantity, the sensing unit (15) including means to deliver a third pulse train (PRESET) to the counter unit (10), the

counter unit (**10**) including means responsive to each pulse in the third pulse train (PRESET) to preset the content (F) of the counter unit to a predetermined greatest quantity (F_{max}),



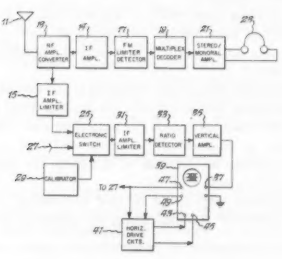
the content (F) of the counter unit (**10**) at the time of each pulse in the first pulse train (FX) constituting a measure of the frequency (f_x) of the first pulse train.

3,930,200

FM MONITORING SYSTEM

Stanley J. Feld, 209 East and West Road, West Seneca, N.Y. 14224

Filed Oct. 3, 1974, Ser. No. 511,777
Int. Cl.² H04B *17/00*
U.S. Cl. 325—134 **12 Claims**



1. Modulation apparatus for monitoring frequency modulated signal transmissions comprising:

means for deriving the frequency modulation signal components from said frequency modulated signal transmission;

means for generating controlled sequential bursts of continuous wave signals at predetermined frequencies, said bursts bearing a fixed relation to modulation limits for said frequency modulated signal transmission;

display apparatus including a visual display screen; and

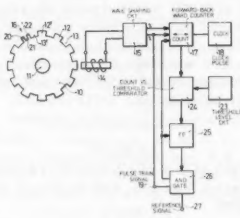
signal processing apparatus operative to alternately apply the frequency modulation signal components from said frequency modulated signal transmissions and the controlled sequential bursts of continuous wave signals to said display apparatus, whereby a visual display is presented to show the relation of the frequency modulation of the signal transmissions to the modulation limits as represented by said sequential bursts of continuous wave signals.

3,930,201

PULSE SOURCE TO PROVIDE A PULSE TRAIN REPRESENTATIVE OF MOVEMENT OF A SHAFT AND A REFERENCE PULSE REPRESENTATIVE OF A REFERENCE POSITION

Fritz Ackermann, Stuttgart; Günter Hönig, Markgroningen, and Alfred Schulz, Braunschweig, all of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Sept. 27, 1974, Ser. No. 509,846
Claims priority, application Germany, Nov. 15, 1973, 2357061
Int. Cl.² G01P *3/44*; H02K *24/00*
U.S. Cl. 328—1 **10 Claims**



1. A pulse source to provide a pulse signal train representative of movement of a movable element (**11**) and a reference pulse signal when the movable element is in a predetermined reference position,

having a transducer system including a plurality of transducer elements (**12, 13, 16**) located on the movable element (**11**) and a transducer receiver (**14**) located in energy transfer coupling with respect to said plurality of elements, and providing said signals upon passage of the transducer elements past the receiver,

wherein

the transducer elements comprise projecting teeth (**12**) separated by gaps (**13**) to provide a sequence of pulses in the transducer receiver (**14**) having a 1:1 sensing relationship of elements and resulting pulses;

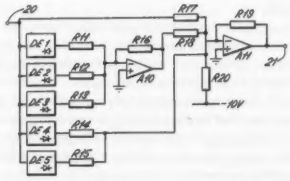
and wherein one of the transducer elements (**16**) is shaped differently from the others (**12**) and comprises a group of tooth portions (**20, 22**) separated by gaps (**21**), located within the space of any other tooth (**12**) and in advance of that transducer element (**12'**) which provides the reference pulse.

3,930,202

FUNCTION GENERATOR CIRCUIT

John Alden Dever, London, England, assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 11, 1973, Ser. No. 368,657
Claims priority, application United Kingdom, June 9, 1972, 26941/72
Int. Cl.² G06G *17/12*
U.S. Cl. 328—142 **3 Claims**



1. A function generator comprising an input terminal, a signal summing circuit, a plurality of signal rectifying circuits

connected in parallel between said input terminal and said summing circuit; each of said signal rectifying circuits including biasing means for biasing a corresponding one of said signal rectifying circuits to conduct with a particular resistance at a particular input voltage so that the characteristics of said signal rectifying circuits thereby sum to form a combined characteristic of segmental form, and including a non-rectifying signal circuit connection from said input terminal to said summing circuit having a straight line characteristic which coincides with a representative or substantially central segment of the combined characteristic and which passes through the input equals zero line to one side of the origin of the input equals zero line, the characteristics of said rectifying circuits thus summing with the straight line characteristic of the non-rectifying circuit on a corresponding side of the central segment of the combined characteristic.

3,930,203
CIRCUIT ARRANGEMENT FOR ADJUSTING THE PHASE STATE OF A TIMING SIGNAL

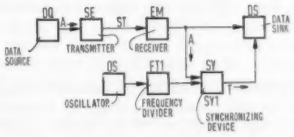
Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1974, Ser. No. 518,813

Claims priority, application Germany, Oct. 29, 1973, 2354072

Int. Cl.² H04B *1/02*

U.S. Cl. 328—155 **6 Claims**



1. Apparatus for adjusting the phase state of a timing signal which has been obtained by means of a frequency divider from a divider signal, wherein a discriminator signal is produced in dependence on the phase state of a binary signal and wherein pulse edges of the divider signal are added to or suppressed from the divider signal, comprising:

polarity reversal means,

first channel means connecting said divider signal to said polarity reversal means and then to an input of said frequency divider,

second channel means connecting said divider signal to an input of said frequency divider,

switching means for selectively connecting said divider signal to said first or second channel in dependence on the value of said discriminator signal.

3,930,204
DEVICE AND CIRCUIT FOR DETECTING A PULSE SIGNAL IN NOISE IN REAL TIME

Mortimer H. Zinn, Elberon; George W. Taylor, Brielle, and Kenton Garoff, Little Silver, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,963

Int. Cl.² H01J *31/58*

U.S. Cl. 328—229 **11 Claims**

1. A device for distinguishing a signal in the presence of noise, said device (including) comprising

an evacuated housing;

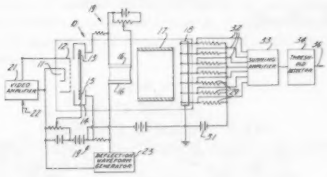
a planar array of diodes mounted at a first location in said housing.

a source of electrons mounted at a second location in said housing;

means mounted in said housing for accelerating electrons from said source towards said planar array;

means for sequentially directing said accelerated electrons to preselected portions of said planar array; (and)

means mounted on said housing for modulating the amplitude of said accelerated electrons;



a summing means connected to each of the diodes in said diode array for summing the output thereof; and

a threshold means for providing a signal when the output of said summing means exceeds a predetermined level.;

3,930,205
ARRANGEMENTS FOR AUTOMATICALLY ADJUSTING CORRECT REFERENCE VALUES FOR YARN FAULTS IN ELECTRONIC YARN CLEANERS

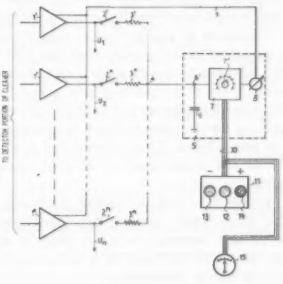
Kurt Aeppli, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Feb. 18, 1972, Ser. No. 227,509

Claims priority, application Switzerland, Feb. 19, 1971, 2427/71

Int. Cl.² H03G *3/22*

U.S. Cl. 330—2 **10 Claims**

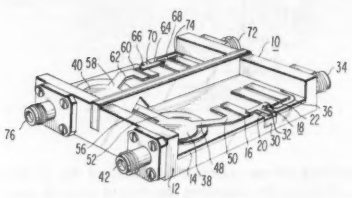


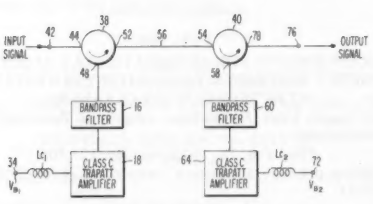
1. An arrangement for automatically adjusting and correcting the reference values for yarn faults in electronic yarn cleaners comprising, in combination with at least two yarn cleaners each having a variable gain amplifier providing an output control signal, a respective switch and resistance connected in series to the output of each amplifier and to a common point, comparator means for comparing the voltage at said common point with a reference voltage, and regulating means for regulating the gain of all of said amplifiers collectively in accordance with the difference between said reference voltage and the voltage at said common point as provided by said comparator means.

3,930,206
BROAD-BAND AMPLIFIER USING CASCADED CLASS C AMPLIFIERS

Arye Rosen, Cherry Hill, N.J., and James Francis Reynolds, Beverly, Mass., assignors to Robert L. Troike and RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 466,796, May 3, 1974. This application Mar. 31, 1975, Ser. No. 563,813
Int. Cl.² H03F 3/60
U.S. Cl. 330—53 **9 Claims**





1. An amplifier for amplifying microwave signals above a given level over a given relatively broad band of frequencies comprising:

a first avalanche diode amplifier including a first avalanche diode and a first bandpass filter with one terminal of the diode coupled to said first filter and the other terminal to a reflecting means, said first diode being reverse biased an amount requiring a signal above said given level to achieve negative conductance and amplification, said first filter adapted to apply signals only substantially at frequencies f_1 through f_2 above said given level to said diode and to reflect signals substantially above frequency f_2 without any amplification, where frequency f_1 is at one end of the broad band of frequencies and f_2 is a frequency generally at the midfrequency of said broad band of frequencies;

a second avalanche diode amplifier including a second avalanche diode and a second bandpass filter with one terminal of said second diode coupled to said second filter and the other terminal to a reflecting means, said second diode being reverse biased an amount requiring a signal above said given level to achieve negative conductance and amplification, said second filter adapted to apply signals only substantially at frequencies f_2 through f_3 above said given level to said second diode and to reflect signals substantially below frequency f_2 and above frequency f_3 without amplification, where f_3 is at the other end of said broad band of frequencies;

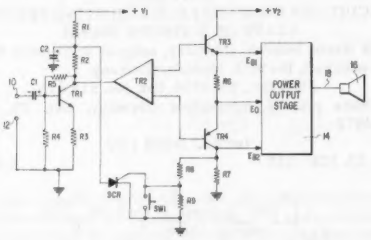
first means for coupling microwave signals over said relatively broad band of frequencies to said first filter, and for coupling the reflected signals at said first filter to said second filter, whereby microwave signals substantially at frequencies f_1 through f_2 are amplified by said first amplifier and are reflected back through said first filter and applied to said second filter and microwave signals generally above frequency f_2 are reflected at said first filter and applied to said second filter without amplification; and

second means for coupling the reflected signals at said second filter to an output terminal whereby microwave signals generally from frequency f_2 through f_3 are amplified by said second amplifier, are reflected back through said second filter and are applied to said output terminal, and microwave signals generally below frequency f_2 are reflected at said second filter and are applied to said output terminal without further amplification.

3,930,207
AMPLIFIER WITH OVERLOAD PROTECTION

Frank J. Kosinski, Hauppauge, N.Y., assignor to Unicord, Incorporated, New York, N.Y.

Filed June 10, 1974, Ser. No. 477,758
Int. Cl.² H03F 3/183
U.S. Cl. 330—207 P **2 Claims**



1. In an amplifier circuit having a preamplifier stage, power supply means for said preamplifier stage, an output stage, an output driver stage responsive to the output signal of said preamplifier stage and driving said output stage, said output driver stage including a pair of driver transistors connected in quasicomplimentary push-pull configuration whereby the emitter of one of said transistors provides a first driving signal to said output stage and the collector of the other of said transistors provides a second driving signal to said output stage, power supply means for said output driver stage, one side thereof being connected to the collector of one of said transistors and the other side thereof being connected through a first resistor to the collector of the other of said transistors, an overload protection circuit, comprising:

a silicon controlled rectifier connected to said preamplifier power supply means through the anode and cathode terminals of the silicon controlled rectifier and in parallel circuit relation to the power connections of said preamplifier stage; and

a gating circuit for said silicon controlled rectifier comprising second and third resistors in series connection with one another and in parallel connection with said first resistor and conductor means directly connecting the gate of said silicon controlled rectifier to the junction of said second and third resistors, the arrangement being such that said silicon controlled rectifier is gating into its conductive state when the current drain through said first resistor exceeds a predetermined level.

3,930,208
A-C SIGNAL PROCESSING CIRCUITS FOR COMPANDORS

James Douglas Winter, Ottawa, and Mark Alexander Elder, Carp, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

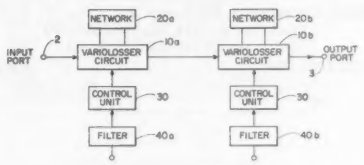
Filed Aug. 29, 1974, Ser. No. 501,492
Int. Cl.² H04B 1/64
U.S. Cl. 333—14 **13 Claims**

1. An alternating current signal processing circuit, for use in a compandor and havaing input and output ports, comprising:

a plurality of variolossers, each having a variable gain characteristic;

buffer amplifier means residing between the variolossers in the plurality of variolossers, for providing impedance isolation between the variolossers, the variolossers connected in tandem between the input and output ports via the buffer amplifier means;

a filter network in combination with each variolosser, for limiting the variable gain characteristic of the variolosser to a mutually exclusive operational band of frequencies as determined by the stop band characteristic of the filter network, and providing a nearly constant gain characteristic for other frequencies as determined by the pass band impedance of the filter network;



a separate control unit associated with each variolosser, for generating a control signal for controlling the associated variolosser, each control unit having an input, the inputs connected in common one with the other and to one of said ports, each control unit being responsive to alternating current signals having frequencies in the mutually exclusive band of frequencies of the variolosser associated therewith and appearing at the input of the control unit;

whereby the relative dynamic range of the alternating current signals, of frequencies falling within the operational frequency band of each variolosser, is altered according to the response of the control units to the alternating current signals and the response of the variolossers to the control signals.

3,930,209

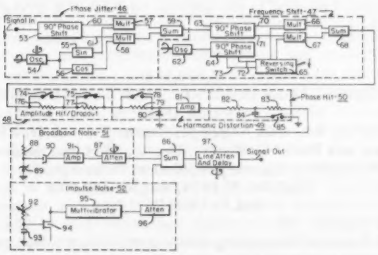
TRANSMISSION LINE SIMULATOR

Mitchell A. Popick, Stony Brook; Robert M. Milne, III, and Suresh K. Aggarwal, both of Queens, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed June 5, 1973, Ser. No. 367,275

Int. Cl.² H03H 7/16, 7/22

U.S. Cl. 333—23 **13 Claims**



1. A transmission line simulator for simulating one of a number of transmission lines having an input and an output and having serially connected therebetween,

an attenuation and delay simulator comprising active circuits for selectively simulating the attenuation and delay characteristics of a selected one of a number of transmission lines, and

circuit means for selectively modifying the signal supplied thereto to simulate one or more of the random effects of phase jitter, frequency shift, amplitude hit and/or drop out, harmonic distortion, phase hit, broad band noise and impulse noise which result from transmission from a signal over a transmission line,

said circuit means including phase jitter circuit means which produces a signal which can be expressed as A sin (wt + B sin $w_j t$) where the input signal to said phase jitter circuit means has an amplitude A, a radian frequency w, B is the amplitude of phase jitter and w_j is the phase jitter radian frequency.

3,930,210

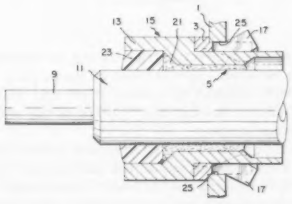
MOUNTED CERAMIC FILTER

Robert David Hollyday, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 12, 1973, Ser. No. 423,942

Int. Cl.² G12B 9/04; H02B 1/04

U.S. Cl. 333—79 **4 Claims**



1. A filter assembly mounted in an opening in a grounding panel,

a tubular ceramic feed through filter,

an electrically conductive sleeve of a relatively rigid metal material secured about the filter,

a tubular electrically conductive locking ring having an enlarged flange portion abutting said panel and being of larger diameter than the opening and having an inner diameter receiving said sleeve and provided with axially extending angularly spaced fingers,

the outer surfaces of the fingers normally lying on a circle of a diameter receivable in the opening extending through and beyond said panel,

the fingers being progressively thicker normally inwardly in a direction away from the flange so that their interior surfaces lie against and frictionally engage over said sleeve,

portions of the fingers being forcefully driven by said sleeve outwardly beyond the periphery of the opening to frictionally lock the sleeve within said opening.

3,930,211

CIRCUIT BREAKER

Harold E. Belttary, Rio Piedras, P.R., assignor to Caribe Circuit Breaker Co., Inc., San Juan, P.R.

Filed Nov. 25, 1974, Ser. No. 526,804

Int. Cl.² H01H 73/04

U.S. Cl. 335—6 **5 Claims**

1. A circuit breaker including

a stationary contact;

a movable contact;

a contact carrier having the movable contact mounted thereon;

an operating mechanism for manually moving said contact carrier to selectively open and close said contacts;

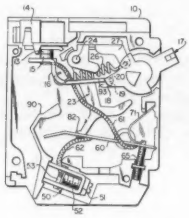
a load terminal;

a tripping mechanism including a current responsive member in a conductive path between said movable contact

and said load terminal for moving said contact carrier to open said contacts in response to a current overload condition through said current responsive member;

a flexible conductor connected in the current path between said movable contact and said current responsive member;

said flexible conductor being directly connected to said movable contact whereby said conductive path includes the movable contact and the flexible conductor, and said contact carrier is not an element directly in said conductive path;



a region of the contact carrier having an opening therethrough between opposite sides of the contact carrier;

said movable contact extending from one side of said contact carrier through said opening to the other side of said contact carrier;

said movable contact being fixed to said contact carrier and having a contact surface on the one side of said contact carrier for engaging the stationary contact; and

said movable contact having a surface in the direct fixed connection with said flexible conductor on the other side of said contact carrier.

3,930,212

METHOD OF ORIENTING ELECTRICALLY CONDUCTIVE BODIES, PREFERABLY NON-MAGNETIC ONES, IN A MAGNETIC FIELD AND APPARATUS FOR PERFORMING SAME

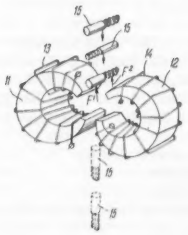
Benyamin Alexandrovich Ioffe; Robert Karlovich Kalnin; Vyacheslav Semenovich Dorofeev; Viktor Georgievich Sirotenko, all of Riga; Vladimir Borisovich Larin, Smolensk; Gunar Yanovich Sermons, and Alexandr Alexandrovich Shevchenko, both of Riga, all of U.S.S.R., assignors to Institut Fiziki Akademii Nauk Latviiskoi SSR, U.S.S.R.

Continuation of Ser. No. 885,190, Dec. 15, 1969. This application Jan. 16, 1974, Ser. No. 433,885

Claims priority, application U.S.S.R., Dec. 25, 1968, 1289054; Dec. 25, 1968, 1289056

Int. Cl.² H01F *7/20*

U.S. Cl. 335—284 **1 Claim**



1. A method of orienting and fixing nonmagnetic electrically conductive bodies under the action of a non-uniform magnetic field induced by an alternating electric current, said method comprising distributing, in a zone of simultaneous orientation and fixation, the inductance of the magnetic field in such a way that bodies are acted upon by a field with at least one non-uniform part, forming a central plane section in said part of the field, the inductance of which field tapers in said section towards a center of fixation corresponding to a minimum value of the inductance of the field, and forming the cross-section of said section relative to the field direction depending upon the form of the cross-section of the body in its position of fixation.

3,930,213

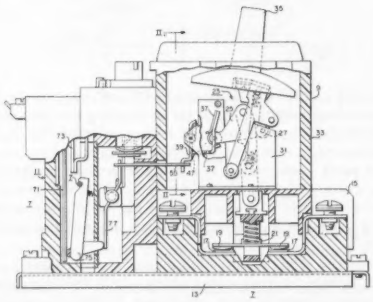
MANUALLY OPERABLE CIRCUIT INTERRUPTER WITH AUTOMATIC CURRENT OVERLOAD PROTECTION

Edward L. Richards, Aliquippa, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1974, Ser. No. 513,371

Int. Cl.² H01H *71/16*

U.S. Cl. 337—70 **5 Claims**



1. A circuit interrupting device comprising relatively movable contact means and means releasable to effect automatic opening of said contact means, operating means for moving the contacts between open and closed positions and comprising a releasable arm movable between latched and unlatched positions, a latch lever operable to effect unlatching of the releasable arm, a retainer plate effective to releasably retain the latch lever in the latched position, a trip device comprising a trip plate and bi-metal means for activating the trip plate in response to excessive currents, the trip plate being operatively connected to the retainer plate to move the retainer plate to the unlatched position, and the retainer plate being spring-biased in the latched position with the latch lever and including an extension engageable with the latch lever when in the unlatched position to maintain the latch lever in a relatching position.

3,930,214

PUSHBUTTON ELECTRIC SWITCH WITH RESET MECHANISM

Edward L. Richards, Aliquippa; Charles R. Paton, New Brighton, and Daniel G. Rooney, Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

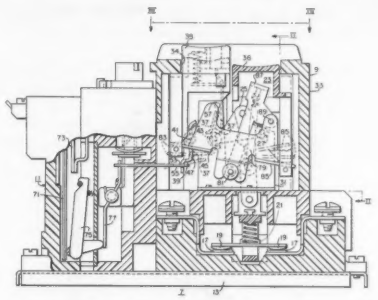
Filed Oct. 9, 1974, Ser. No. 513,372

Int. Cl.² H01H *77/04*

U.S. Cl. 337—72 **6 Claims**

1. A circuit interrupting device comprising a switch mechanism and an electrically insulating housing therefor, the switch mechanism comprising relatively movable contact means, operating means for moving the contact between open and closed positions and comprising an overcenter toggle and releasable arm operable to effect movement of the movable contact structure, the releasable arm also being movable between tripped and latched positions, a latch lever releasably connected to the releasable arm for retaining said arm in the

latched position, means responsive to a current overload condition for actuating the latch lever to the tripped position, the housing having an opening, a reset pushbutton extending through the opening and effective to move the releasable arm



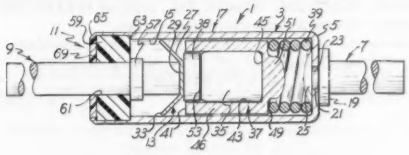
to the latched position with respect to the trip lever, a first pushbutton extending through the opening and effective to move the releasable arm to the open position, and a second pushbutton extending through the opening and effective to move the releasable arm to the closed position.

3,930,215

NONRESETTABLE THERMALLY ACTUATED SWITCH

Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 29, 1974, Ser. No. 527,973
Int. Cl.² H01H *37/76*
U.S. Cl. 337—407 **8 Claims**



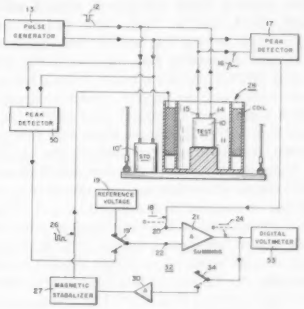
1. A nonresettable thermally actuated switch comprising a case of electrically conductive material, first power lead means electrically connected to said case, second power lead means, means securing said second lead means relative to said case in electrically insulated relation to said case, a deformable connector of electrically conductive material in electrical engagement with said second lead means and normally in electrical engagement with said case to complete the electrical circuit between said first and second lead means, a cup-shaped separator of rigid electrically insulating material having an open end and an edge around said open end, a normally solid body of material fusible at a selected temperature disposed in said cup-shaped separator, a force spreader member of a size slidable in said cup-shaped separator normally disposed in engagement with said solid body of fusible material at said open end of said cup-shaped separator, and spring means biasing said separator to normally press said force spreader member via said fusible body against said connector to permit said connector to maintain said circuit while said fusible body is solid and for moving said separator when said fusible material is heated to said selected temperature to allow said force spreader member to move into said separator and to move said separator edge into engagement with said connector to deform and to separate said connector from said case to break said circuit.

3,930,216

METHOD OF MAKING GEOPHONES HAVING MATCHED SENSITIVITIES

Ernest M. Hall, Jr., Houston, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

Filed Apr. 1, 1974, Ser. No. 456,487
Int. Cl.² G01V *1/00*; H04B *13/00*; H04R *15/00*
U.S. Cl. 340—5 C **8 Claims**



1. A method of adjusting the impulse response sensitivity of a geophone having a coil mounted for movement relative to a permanent magnet, comprising:

a. applying an electric impulse to the coil of the geophone to thereby displace the coil from a quiescent position;

b. detecting the geophone's response signal to said impulse, said response signal being generated by said coil;

c. producing an error signal by comparing said response signal with a reference signal; and

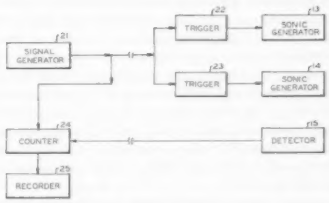
d. applying a magnetic field to the magnet of the geophone, said magnetic field having an amplitude and polarity in dependence upon said error signal.

3,930,217

SONIC LOGGING RECORDING APPARATUS

Bruce F. Wiley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 6, 1973, Ser. No. 422,268
Int. Cl.² G01V *1/40*; G04F *10/04*
U.S. Cl. 340—15.5 TN **4 Claims**



1. In an acoustical logging device which includes first and second acoustical signal generators spaced from one another and an acoustical receiver spaced a first distance from said first generator and a second lesser distance from said second generator; apparatus to measure the difference in times of propagation of acoustical signals from the two generators to the receiver, comprising:

an up-down digital counter having first and second inputs;

first means to actuate said first generator to generate an acoustical signal and to actuate said counter to count up at a first time;

second means responsive to an acoustical signal being received by said receiver at a second time following said first time to stop said counter from counting up;

third means to actuate said second generator to generate an acoustical signal and to actuate said counter to count down at a third time; and

fourth means responsive to an acoustical signal being received by said receiver at a fourth time following said third time to stop said counter from counting down;

said first, second, third and fourth means including first, second, third, fourth, fifth, sixth and seventh NAND circuits, each having first and second inputs and an output; means connecting said receiver to the first input of said first NAND circuit; a multivibrator having first and second inputs and an output; means to apply a pulse to the first input of said multivibrator and to the first input of said fourth NAND circuit when said first generator is actuated; means to apply a pulse to the second input of said multivibrator and to the first input of said seventh NAND circuit when said second generator is actuated; an oscillator connected to the second input of said second NAND circuit and to the first input of said third NAND circuit; means connecting the output of said multivibrator to the second input of said first NAND circuit; means connecting the output of said first NAND circuit to the second input of said fifth NAND circuit and to the second input of said sixth NAND circuit; means connecting the output of said fourth NAND circuit to the first input of said second NAND circuit and to the first input of said fifth NAND circuit; means connecting the output of said seventh NAND circuit to the second input of said third NAND circuit and to the first input of said sixth NAND circuit; means connecting the output of said sixth NAND circuit to the second input of said seventh NAND circuit; means connecting the output of said fifth NAND circuit to the second input of said fourth NAND circuit; means connecting the output of said second NAND circuit to the first input of said counter; and means connecting the output of said third NAND circuit to the second input of said counter.

3,930,218

GEOPHONE CASINGS

Ernest M. Hall, Jr., Houston, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

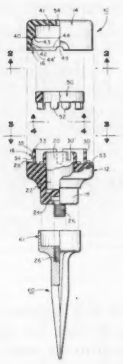
Filed Jan. 16, 1974, Ser. No. 433,637
Int. Cl.² G01V 1/16
U.S. Cl. 340—17 **1 Claim**

1. In a geophone casing comprising: a base made from a rigid, nonconductive material, said base defining a first substantially cylindrical chamber adapted to receive therein the bottom end of a seismic geophone, said base having a first wall; a cover for said base, said cover being made from a rigid, nonconductive material, said cover defining a second substantially cylindrical chamber adapted to receive therein the top end of said geophone, said cover having a second wall, said first and second walls having openings therein to allow the geophone's leads to exit outwardly of the casing, the improvement consisting of:

wholly self-locking means having a rigid male prong and a rigid female prong forming integral part with said first and second walls, respectively; said male and female prongs interlocking with each other when said base and said cover are forcibly assembled together,

said male prong having a frusto-conical, external surface tapering inwardly toward the free end thereof, and the male prong defining an external annular shoulder spaced from said free end,

said female prong having a mating cavity matching in shape the shape of said external surface and including an annular lip engageable beneath said external annular shoulder, said male prong being constructed to have sufficient resiliency to slightly bend inwardly when said lip is pushed downwardly over said frusto-conical surface until said lip comes to rest under said annular shoulder, and



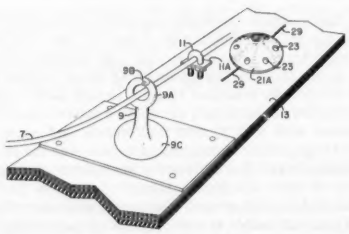
said cover comprising an internal ring having downwardly-extending cleats adapted to engage the geophone's leads inside said casing.

3,930,219

SYSTEM FOR TRANSPORTING SEISMIC ENERGY DETECTORS

Richard J. Kostelnicek, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Continuation of Ser. No. 224,205, Feb. 7, 1972, abandoned.
This application Feb. 15, 1974, Ser. No. 442,998
Int. Cl.² G01S 9/66
U.S. Cl. 340—17 **12 Claims**

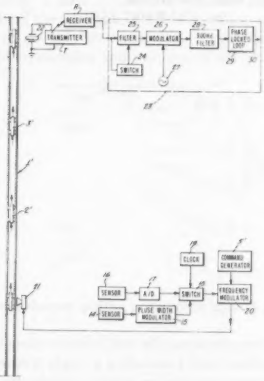


1. An apparatus for transporting seismic energy detectors across the earth's surface which comprises an elongated transport member adapted to carry said seismic detectors across the earth's surface, said transport member being deformable and capable of being placed in a state of tension by friction between said member and the earth's surface during movement across the earth's surface and retraction means connected to said transport member and operable subsequent to said movement across the earth's surface to place at least a substantial portion of said transport member in a slack condition.

3,930,220
BOREHOLE SIGNALLING BY ACOUSTIC ENERGY

Elbert N. Shawhan, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 12, 1973, Ser. No. 396,635
Int. Cl.² G01V 1/40
U.S. Cl. 340—18 FM 22 Claims

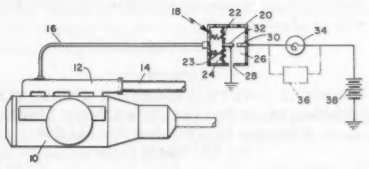


7. System set forth in claim 6, wherein said means at location B also acts, upon the receipt by said pickup of carrier frequency f_2, to tune said output circuit to frequency f_1.

3,930,221
EXHAUST BACKPRESSURE WARNING SYSTEM

Frank Thing, P.O. Box 35, Guatay, Calif. 92031

Filed Mar. 9, 1973, Ser. No. 339,838
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B60Q 1/00; F02B 77/10
U.S. Cl. 340—52 R 2 Claims



1. An exhaust backpressure warning system for an internal combustion engine comprising:

an exhaust system;

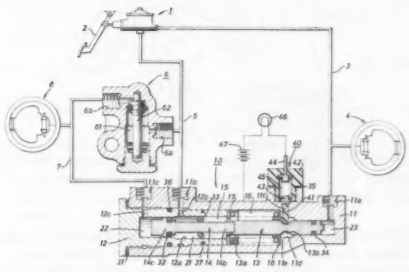
a pressure sensor operably connected with said exhaust system and responsive to abnormally high pressure within said exhaust system; and

a signal device activated by said sensor and positioned near the normal operating station of said engine to alert the operator thereof of an abnormally high pressure condition in said exhaust system.

3,930,222
MONITORING DEVICE FOR HYDRAULIC BRAKE SYSTEM

Noriakira Ishigami, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 26, 1974, Ser. No. 536,395
Claims priority, application Japan, Dec. 27, 1973, 48-3101; Mar. 19, 1974, 49-32081; June 26, 1974, 49-73536
Int. Cl.² B60T 17/22
U.S. Cl. 340—52 C 10 Claims



1. A device for monitoring breakage in a hydraulic brake system of a vehicle having a first braking fluid pressure circuit connecting a tandem master cylinder with the front wheel brake cylinders and a second braking fluid pressure circuit connecting the master cylinder with the rear wheel brake cylinders and provided therein with a fluid control device to regulate the braking fluid pressure applied to the rear wheel brake cylinders, said monitoring device comprising:

a cylinder housing provided thereon with a first port to be connected with said first braking fluid pressure circuit, a second port to be connected directly with said master cylinder through said second braking fluid pressure circuit and a third port to be connected with said rear wheel brake cylinders through said second braking pressure circuit, said housing being provided therein with a first bore in communication with said first port and a second stepped bore communicated at its small diameter bore with said third port and at its large diameter bore with said second port;

a plunger engaged slidably at its one portion with said first bore to form a first pressure chamber in communication with said front wheel brake cylinders through said first port and engaged slidably at its other portion with the small diameter bore of said stepped bore to form a third pressure chamber in communication with said rear wheel brake cylinders through said third port;

a sleeve member engaged slidably with the large diameter bore of said stepped bore to form a second pressure chamber in communication with said second port at one end face thereof, said plunger passing through said sleeve member to be slidable and being engaged with the other end of said sleeve member;

resilient means for biasing said sleeve toward said second pressure chamber; and

warning means provided on said cylinder housing to be activated in response to sliding movement of said plunger to alarm breakage in said hydraulic brake system.

3,930,223
APPARATUS FOR INDICATING PNEUMATIC TIRE PRESSURE

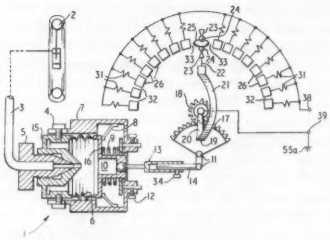
Nicolas Fotios Tsagas, Liverpool, England, assignor to Alexis Kalogeropoulos, England; a part interest

Filed Sept. 14, 1973, Ser. No. 397,427

Claims priority, application United Kingdom, Sept. 20, 1972, 43450/72; Dec. 8, 1972, 56708/72; Jan. 15, 1973, 02067/73; July 13, 1973, 33453/73

Int. Cl.[2] G08B *21/00*; B60C *23/04*

U.S. Cl. 340—58 10 Claims



1. In an apparatus for indicating pneumatic pressure of a tire carried by a vehicle wheel, converting means adapted to be placed in communication with the interior of the tire for converting variations in pneumtic pressure in the tire into mechanical displacements the magnitude and direction of which correspond to pressure changes, transmission means operatively connected to said converting means to be moved thereby and carrying first electrical contact means for moving the latter along a predetermined path in response to pressure changes, a plurality of discrete electrical contact means distributed along said path and each having a different resistance magnitude associated therewith and respectively corresponding to tire pressures when said first contact means engages the plurality of second contact means, an electric circuit connected to and formed in part by said first and second contact means to at least partly close said circuit when one of said second contact means is engaged by said first contact means, and an indicating device in the circuit and responsive to current flow, said indicating device being calibrated to indicate variations in tire pressure proportional to the magnitude of the current permitted to flow in the circuit by the relative positioning of said first and second contact means, said first contact means including at least one metal rolling means rotatably carried by the remainder of said first contact means and rollable along said path to have rolling contact with said plurality of said second contact means, so that friction between said first and second contact means during tire pressure changes when the vehicle travels is reduced to a minimum, said path forming part of a circle and said transmission means including a spring bias means having at least one pivotally mounted leaf spring connected through said transmission means to said converting means to be turned thereby and carrying said first electrical contact means for rolling the latter along said path and biasing said metal rolling means against said plurality of said second contact means, said rolling means being at least one wheel displaceable between a plurality of pairs of spaced apart metallic surfaces forming the second electrical contact means with the metallic surfaces of each pair being electrically interconnected and with the pairs of surfaces being electrically insulated from one another, whereby contact of said wheel with the second contact means is ensured for optimum periods despite vibrational influences.

3,930,224
TRANSMISSION OF INFORMATION

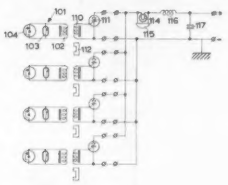
Roland G. Whiteing, 45 Duncan Road, Glenferness, Johannesburg, Transvaal Province, and Johannes G. van Mill, 12 Lucas Road, Eastleigh, Edenvale, Transvaal Province, both of South Africa

Continuation-in-part of Ser. No. 252,227, May 11, 1972, Pat. No. 3,840,850. This application Apr. 23, 1973, Ser. No. 353,655

Claims priority, application South Africa, Nov. 7, 1972, 72/7885The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.[2] B60C *23/02*

U.S. Cl. 340—58 6 Claims



1. A warning device associated with a movable body comprising:

transmitter means mounted on said body to move therewith, said transmitter means including a single transmitter coil and a condition-responsive switch electrically interconnected with said coil whereby a circuit is completed through the coil dependent upon the position of the switch;

receiver means mounted on a stationary body adjacent said movable body, said receiver means including a single receiver coil and a magnetic field source, said source being capable of inducing a current in said transmitter coil when proximate said transmitter coil;

a magnetically operated switch connected in parallel with said transmitter coil and operated by said source as current is induced in said transmitter coil so as to produce a back E.M.F. which is inductively coupled by the transmitter coil to said receiver coil when the condition-responsive switch is positioned to prevent completion of said circuit through the transmitter coil and the condition-responsive switch; and

means joined to said receiver coil and responsive to a predetermined level of voltage induced on the receiver coil as a result of said back E.M.F. for providing a warning upon occurrence of a condition which changes the position of said condition-responsive switch to one preventing completion of said circuit.

3,930,225
VEHICLE SAFETY INDICATING APPARATUS

Roxie Mollico, Rte. 4, Box 511, Duluth, Minn. 55802

Filed Jan. 16, 1975, Ser. No. 541,500

Int. Cl.[2] H01H *35/14*

U.S. Cl. 340—62 10 Claims

1. Safety indicating apparatus for use with motor vehicles having an accelerator pedal comprising in combination:

a. first switch member including a first contact, a second contact, and a third contact and having a first switch position electrically interconnecting the first contact and the second contact and having a second switch position electrically interconnecting the first switch contact and the third switch contact;

b. safety light member, including a first contact and a second contact;

c. a power supply having a first terminal and second terminal with the first and second terminals comprising one

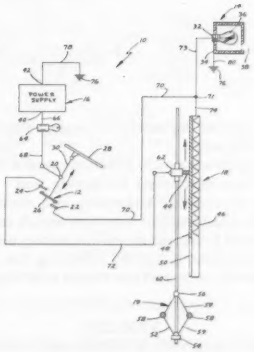
common terminal and one terminal of a voltage differing from the common terminal;

d. an electrical connection between the first terminal of the power supply and the first contact of the first switch;

e. an electrical connection between the first contact of the safety light and the second contact of the first switch;

f. an electrical connection between the second terminal of the power supply and the second contact of the safety light;

g. second switch including a fourth contact, a fifth contact, and an elongated member, with the elongated member including a first conductive portion covering a fixed length of the elongated member and a second non-conductive portion covering the remaining length of the elongated member and with one of the contacts moveable



along the elongated member and with the other of the contacts being electrically interconnected to the first conductive portion;

h. an electrical connection between the third contact of the first switch and the fourth contact of the second switch;

i. an electrical connection between the fifth contact of the second switch and the first contact of the safety light;

j. means for operatively connecting the first switch to the accelerator pedal for causing the switch to be placed in its first position when the accelerator pedal is undepressed and causing the switch to be placed in its second position when the accelerator pedal is depressed; and

k. velocity means for providing an output indicative of the driving velocity of the vehicle including means responsive to the output of the velocity means for moving the fourth contact along the elongated member.

3,930,226

AUTOMATIC TAMPER ALARM FOR MOTOR VEHICLES

Leonard G. Plumberg, Olathe, Kans., assignor to Donald E. Funck, Overland Park, Kans.

Filed Apr. 22, 1974, Ser. No. 462,659
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—64 **3 Claims**

1. A tamper alarm for motor driven vehicles for activating an external transducer in response to preselected events, the alarm having an output and functioning in cooperation with the vehicle ignition switch, the alarm comprising:

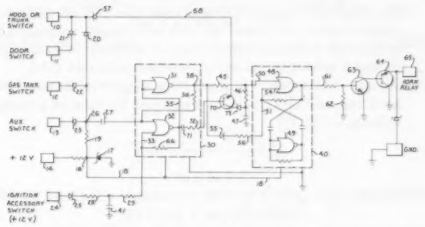
a plurality of alarm input means for initiating alarm circuitry operation in response to inputs delivered thereto;

means for generating a trigger signal for a predetermined time interval in response to at least one of said alarm inputs, the trigger signal generation means comprising a monostable multivibrator having at least one input and an output, one of said monostable multivibrator inputs interconnected with said alarm input means;

means for generating an intermittent output signal for said external transducer in response to said trigger signal, the last mentioned means comprising

an astable multivibrator having at least one input and an output, the astable multivibrator inputs interconnected to said monostable multivibrator output,

means for interconnecting said astable multivibrator output with said external transducer,



means cooperating with the vehicle ignition and/or accessory switch for automatically disabling said alarm whenever said vehicle ignition and/or accessory switch is activated,

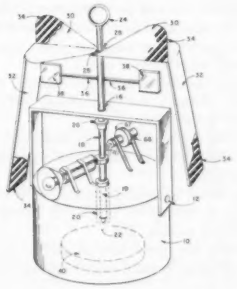
said monostable multivibrator comprising at least one NOR-gate having at least one input and said alarm disabling means further comprises an interconnection between said vehicle ignition and/or accessory switch and said NOR-gate input, the interconnection operable to disable said monostable multivibrator by turning off said NOR-gate when said ignition switch is turned to the ignition on or accessory position.

3,930,227

PORTABLE MOTOR VEHICLE VISUAL WARNING INDICATOR

Sonia M. Gof, 89 Haledon Ave., Paterson, N.J. 07522

Filed Nov. 26, 1973, Ser. No. 418,811
Int. Cl.[2] B60Q *1/36*
U.S. Cl. 340—81 R **5 Claims**



1. A portable motor vehicle visual warning indicator comprising in combination:

a base;

a support bracket attached to said base;

a vertically oriented rotatable shaft, one end of which is mounted in said base; said shaft extending upwardly through said support bracket and terminating above said support bracket;

a plurality of pairs of wind driven cups mounted on and extending horizontally outward from said rotatable shaft

and above said support bracket, such that when said cups are subjected to a relative wind, they will cause said rotatable shaft to rotate;

each pair of said wind driven cups mounted such that one of its members is mounted on the opposite side of said shaft from the other member;

mirror means mounted on and extending horizontally outward from said rotatable shaft such that said mirror means are caused to rotate when said wind driven cups are driven by a relative wind;

daylight reflective means connected with and driven by said wind cups;

a tab attached to each cup of at least one pair of said wind driven cups, the plane of said tabs being substantially tangential to the circumference of rotation of said cups; daylight reflective means connected with said tabs;

said base constructed in part of a magnetic material for securing said apparatus to a metallic portion of a motor vehicle.

3,930,228
METHOD AND DEVICE FOR READING CHARACTERS, PREFERABLY DIGITS

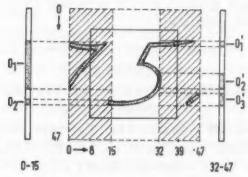
Arie Adriaan Spanjersberg, Leiderdorp, Netherlands, assignor to De Staat der Nederlanden, te dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed Feb. 11, 1974, Ser. No. 441,431

Claims priority, application Netherlands, Feb. 21, 1973, 7302410

Int. Cl.² G06K 9/10

U.S. Cl. 340—146.3 SG **8 Claims**



1. A method for reading hand written characters in predetermined squares marked on a document comprising electronically scanning said characters, said system comprising:

A. scanning predetermined marginal strips on each side of the border lines of said squares,

B. recording the character parts scanned in said strips in an auxiliary memory for processing before transfer to a character processor,

C. erasing for a given character those recorded parts which are not connected to said given character in said square inside strip,

D. adding those recorded parts of said given character in said strip to said given character which cross the border lines of said square, and

E. indicating the presence of more than three separate recorded parts in each said marginal side strip.

3,930,229
HANDWRITING SYSTEM

Hewitt David Crane, Portola Valley, and Robert Ellis Savoie, Mountain View, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 31, 1974, Ser. No. 438,413

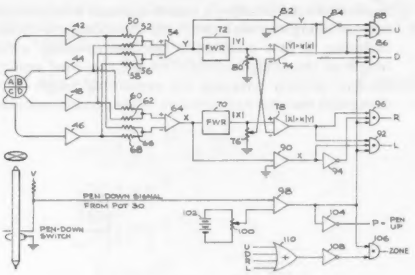
Int. Cl.² G06K 9/00

U.S. Cl. 340—146.3 SY **11 Claims**

1. A system for generating a set of digital signals representative of a handwritten character comprising

pen means for generating for each character which is written a sequence of direction signals representative of the sequence of directions taken in writing a character, and means responsive to predetermined direction signals including

means for storing, for each character, at successive locations, part of the data required for locating the next of said successive locations, with a final one of said locations



storing a set of digital signals representative of a handwritten character,

means for combining each direction signal with data signals derived from said means for storing, and

means for successively addressing said means for storing with both a sequence of direction signals and a sequence of data read from said means for storing until a final one of said locations is located following the last direction signal generated by said pen means in writing a character.

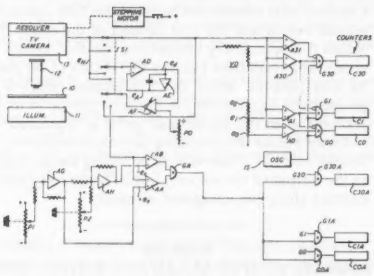
3,930,230
PATTERN ANALYSIS METHOD AND APPARATUS

Richard G. Stephens, 318 Security Mutual Life Bldg., Binghamton, N.Y. 13901

Filed Feb. 25, 1974, Ser. No. 445,340

Int. Cl.² G06K 9/12

U.S. Cl. 340—146.3 AG **20 Claims**



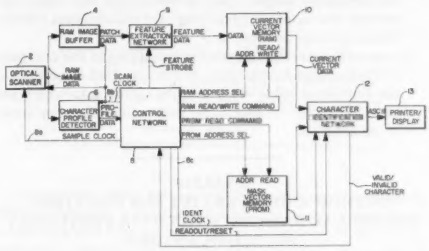
1. In apparatus for classifying a pattern comprised of elemental areas situated within a scanning field, said elemental areas having three or more different light-remissive levels, the combination of scanning means for optically scanning said field and said elemental areas of said pattern to derive a first electrical waveform having a parameter which varies in accordance with the light-remissive level of the elemental area being scanned at a given instant; means for differentiating said first electrical waveform to provide a second electrical waveform having a parameter which varies in accordance with the time rate of change of the light-remissivity of the elemental areas being scanned from instant to instant; signal-processor means responsive to said second electrical waveform for pro-

viding three or more groups of further signals, the signals of each group of said further signals being provided whenever the value of said second waveform lies between a respective pair of values defining a respective range of optical density gradients; and accumulator means for separately accumulating the signals of each of said groups to provide three or more stored data signals defining values of a function characteristic of said pattern.

3,930,231
METHOD AND SYSTEM FOR OPTICAL CHARACTER RECOGNITION

Ernest G. Henrichon, Jr., Wellesley Hills, and Harvey J. Bloom, Bellingham, both of Mass., assignors to Xicon Data Entry Corporation, Newton Upper Falls, Mass.

Filed June 10, 1974, Ser. No. 477,808
Int. Cl.² G06K 9/12
U.S. Cl. 340—146.3 MA **16 Claims**



1. Method for optical character recognition comprising the steps of:

A. optically scanning a character-to-be-recognized to identify it as one of a plurality of predetermined vocabulary characters, detecting the optical density of *n* regions of each scan, said regions being arranged to form a multiple element set of grid cells arranged in a grid of *m* rows and *n* columns, and generating a binary signal representative of the optical density of each of said cells, said binary signal being **1** when the optical density of a region exceeds a predetermined threshold and **0** otherwise, so that each cell of said set has the binary value associated with the correspondingly positioned region of said character-to-be-recognized,

B. generating a series of multiple bit words, each word representing a rectangular arranged subset of said grid cells, the subset including *p* rows and *q* columns, where *p* is an integer less than *m* and *q* is an integer less than *n*, and wherein each word in the series represents a differing subset,

C. determining the presence or absence of *r* features in each word of said series, where *r* is an integer less than the quantity 2^{pq}, and each feature is defined as being present in a word when said word includes a predetermined distribution of binary values, said feature being defined as absent otherwise,

D. generating and storing a multiple bit current vector signal for said character-to-be-recognized, said current vector signal having a binary **1** for each feature detected as present and a binary **0** for each feature detected as absent in each of said words, wherein each bit position in said current vector signal is associated with one of said words,

E. generating and storing a plurality of multiple bit mask vector signals, each representing a different one of said predetermined plurality of vocabulary characters, wherein each bit position in each of said mask vector signals is associated with the same one of said words as the corresponding bit position in said current vector signal,

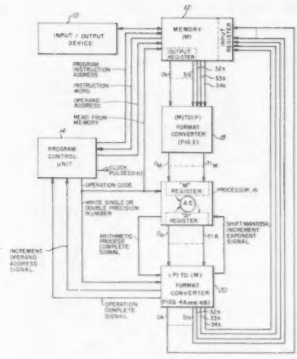
F. comparing said current vector signal with said plurality of stored mask vector signals on a bit-by-bit basis, and

G. identifying the mask vector signal which has highest correlation with current vector signal as the character-to-be-recognized.

3,930,232
FORMAT INSENSITIVE DIGITAL COMPUTER

Steven J. Wallach, Chelmsford; Alan J. Deerfield, Newtonville, and Stanley M. Nissen, Reading, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 23, 1973, Ser. No. 418,641
Int. Cl.² H03K 13/00
U.S. Cl. 340—172.5 **1 Claim**



1. In a digital computer including a memory wherein single precision words may be stored at respective single memory locations and double precision words may be stored at two contiguous memory locations as two single precision words, each one of such words, other than instruction words, including an "*m*" bit operand code field, where "*m*" is the number of bits making up an operand code in any one of a plurality of formats including logical statements, fixed point numbers, floating point single precision numbers and floating point double precision numbers and an "*n*" bit data type code indicative of the format of the operand, and a processor wherein each operand retrieved from the memory during execution of a program may be processed, the improvement comprising

a. a plurality, corresponding in number to the number of different formats of operands, of first format conversion means for changing the format of each single precision word retrieved from the memory during execution of a program, each different one of such first format conversion means being actuated by a different one of the data type codes in each single precision word to convert each operand retrieved from the memory to a particular format of a floating point, double precision word of $2[m + n]$ bits and to combine the two single precision words making up each double precision word retrieved from the memory into said particular format, the states of selected bits in each said particular format floating point double precision word being indicative of the data type code corresponding to each operand retrieved from the memory;

b. means, responsive to each said particular format floating point, double precision word for processing each such word, the states of the selected bits remaining unchanged during processing; and

c. a plurality, corresponding in number to the number of different formats of operands, of second format conversion means, each different one of such second format conversion means being responsive to the states of the

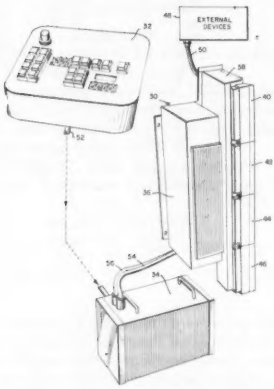
selected bits in each one of said particular format floating point, double precision words out of the processing means to convert each such one to a format corresponding to the original format of the single or double precision words stored in the memory in single or two contiguous memory locations, respectively.

3,930,233

DATA TRANSFER AND MANIPULATION APPARATUS FOR INDUSTRIAL COMPUTER CONTROLLERS

Richard E. Morley, Mason, and Charles C. Schelberg, Jr., Milford, both of N.H., assignor to Modicon Corporation, Andover, Mass.

Filed Apr. 11, 1974, Ser. No. 460,081
Int. Cl.² G06F *3/02, 15/46*
U.S. Cl. 340—172.5 **40 Claims**



1. A programming panel for programming a computer controller to perform data manipulation operations, the computer controller having stored therein an executive program for communicating with the programming panel and for simulating an electrical ladder-type control circuit having a plurality of circuit lines, a plurality of spaces in each circuit line, a first of said spaces providing for the inclusion of one type of a plurality of types of electrical elements comprising elements the condition of which is a function of a referenced condition, a second of said spaces providing for the inclusion of a first character set indicating a first memory area within the controller where data may be retrieved, a third of said spaces providing for the inclusion of a second character set indicating the type of data manipulation to be performed on said retrieved data, a fourth of said spaces providing for the inclusion of a third character set indicating a second memory area within the controller where data may be deposited, at least one of said characters also indicating a third memory area within the controller where a number is stored related to the amount of data placed within said second area, each of said circuit lines further providing circuit line condition specifying means controlled in accordance with the electrical condition of the electrical element within said first space, the executive program simulating the specified electrical element within said first space, retrieving data in said first memory area, performing the data manipulation specified in said third space, depositing data in said second memory area, and updating the number in said third memory area, said programming panel comprising:

A. Manually operable means for specifying to the computer controller one of a plurality of circuit lines of the simulated ladder-type control circuit;

B. manually operable means for specifying to the computer controller one type of a plurality of types of electrical elements;

C. manually operable means for specifying to the computer controller a reference to the circuit line condition specifying means in the simulated ladder-type control circuit which is to control the condition of the said specified type of electrical element;

D. manually operable means for specifying to the computer controller said first space in the specified circuit line of the simulated ladder-type control circuit into which the specified type of electrical element is to be entered;

E. manually operable means for specifying to the computer controller said second space in the specified circuit line of the simulated ladder-type control circuit into which said first character set specifying said first memory area is to be entered;

F. manually operable means for specifying to the computer controller said third space in the specified circuit line of the simulated ladder-type control circuit into which said second character set specifying said desired data manipulation is to be entered; and

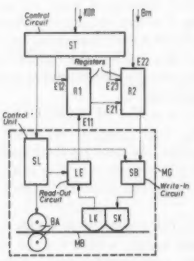
G. manually operable means for specifying to the computer controller said fourth space in the specified circuit line of the simulated ladder-type control circuit into which said third character set specifying said second memory area is to be entered.

3,930,234

METHOD AND APPARATUS FOR INSERTING ADDITIONAL DATA BETWEEN DATA PREVIOUSLY STORED IN A STORE

Rudolf Queisser, Geretsried, and Hubert Schlossbauer, Krailling, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 1', 1974, Ser. No. 487,554
Claims priority, application Germany, July 18, 1973, 2336618
Int. Cl.² G11B *27/00*; G06F *11/00*
U.S. Cl. 340—172.5 **7 Claims**



5. An arrangement for the insertion of additional data in data previously stored in a store, in the form of blocks of uniform block length, by insertion of the additional data in the form of an additional block of like block length, following a $(n-1)^{th}$ block, comprising a store having a read-out circuit and a write-in circuit, a write-in read-out control unit connected to said circuits for controlling the entry and withdrawal of data from said store, a first register connected to said read-out circuit for receiving and storing data from said store, a second register connected to said first register for receiving and storing data from the latter and having an input to which additional blocks may be supplied, said second register being connected to said write-in circuit for supplying its storage content thereto, and a control circuit connected to said registers and to said write-in read-out control unit, for controlling the entry of data into said first register, transfer of data from

said first to said second register, and transfer of data from said second register to said store.

3,930,235

DATA PROCESSING SYSTEM

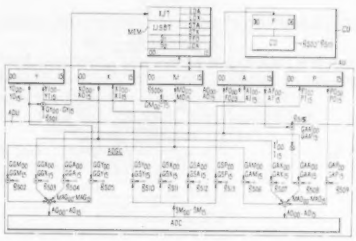
Stanislas Kobus, Palaiseau, France; Juliaan Leo Gerard Janssens, Olmen, and Willy Charles Jacques Zoile, St. Niklaas, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,509

Claims priority, application Belgium, Dec. 10, 1971, 776495

Int. Cl. G06f *13/08, 7/38*

U.S. Cl. 340—172.5 **1 Claim**



1. A data processing system with a processor and a memory (MEM) for storing a plurality of *n*-bit data words, comprising:

an index register (X) having n stages for storing in the $n - m$ last stages a relative address of a data word in a table of said memory;

an accumulator (A) having an accumulator register (AR) for storing therein said data word;

coder means (FFOC, CC) for determining the *m*-bit position of the first bit of said data word having a predetermined one of two conditions, all said bits of said word being ordered in a predetermined way, said accumulator coupled to said coder means and said m-bit position being provided at the *m*-bit output (FO_{00}-FO_{05}) of said accumulator (A);

first means for coupling said memory (MEM) and said accumulator register (AR);

means for accessing a data word from said memory table by using said relative address and for storing said word in said accumulator register (AR) via said first coupling means; and

second means for coupling said $n - m$ last stages of said index register (X) and the *m*-bit output (FO_{00}-FO_{05}) of said accumulator (A) with the $n - m$ first stages and the *m* last stages of said index register respectively, whereby said $n - m$ bit relative address of said word and said *m*-bit position of said bit in said word are combined to obtain in said index register (X) the position of said bit in said memory table.

3,930,236

SMALL MICRO PROGRAM DATA PROCESSING SYSTEM EMPLOYING MULTI-SYLLABLE MICRO INSTRUCTIONS

Alisdair Cullen Ferguson, Bathgate; John McGregor, Currie, and Alastair George MacPherson, Linlithgow, all of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1973, Ser. No. 402,724

Claims priority, application United Kingdom, June 5, 1973, 26716/73

Int. Cl.² G06F *9/16, 9/10*

U.S. Cl. 340—172.5 **4 Claims**

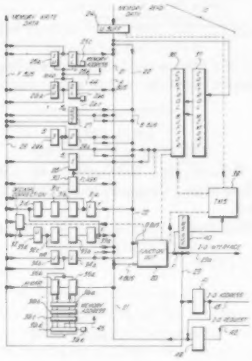
1. A data processing system including a processor having a fixed data path width and a memory having a first portion to store macro instructions and data and a second portion to store different types of micro instruction syllables, each syllable having a width equal to said fixed data path width, said processor comprising:

a function unit to perform logical operations on data;

a plurality of registers coupled to said function unit for data transfer therebetween;

macro instruction accessing means coupled to said memory to receive macro instruction operators from said first memory portion; and

micro instruction accessing means coupled to said function unit and said registers, said micro instruction accessing



means also being coupled to said macro instruction accessing means and to said second memory portion and responsive to said macro instruction operator to access, in sequence, two or more micro instruction syllables from said second portion of said memory so as to form a micro instruction called for by said macro instruction operator wherein the first syllable of said micro instruction specifies a logical operation to be performed by said function unit and the particular ones of said plurality of registers for data transfer to said function unit and the remaining syllables specify literal values.

3,930,237

METHOD FOR AUTOMATING THE PRODUCTION OF ENGINEERING DOCUMENTATION UTILIZING AN INTEGRATED DIGITAL DATA BASE REPRESENTATION OF THE DOCUMENTATION

Philippe Villers, Cambridge, Mass., assignor to The Computervision Corporation, Bedford, Mass.

Filed Mar. 7, 1974, Ser. No. 448,892

Int. Cl.² G06F *15/20*

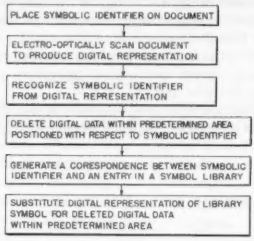
U.S. Cl. 340—172.5 **17 Claims**

1. A method for producing an integrated digital data base representing a document having at least one graphical entity thereon, said method comprising the steps of:

1. placing a symbolic identifier on the document with respect to each graphical entity thereon;
2. electro-optically scanning said document top produce a digital representation thereof,
3. recognizing the symbolic identifier from the digital representation thereof;
4. deleting at least a portion of the digital data within a predetermined area positioned with respect to each symbolic identifier;
5. generating a correspondence between each symbolic

identifier and a particular entry in a symbol library; and,

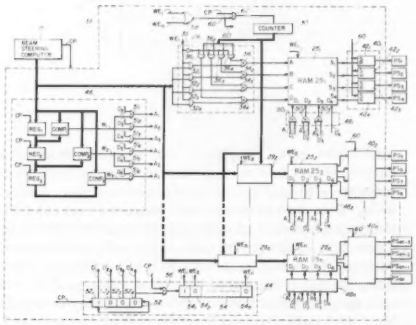
6. substituting for the deleted digital data a digital representation of a library symbol corresponding to the particular symbolic identifier within said predetermined area.


PLACE SYMBOLIC IDENTIFIER ON DOCUMENT
ELECTRO-OPTICALLY SCAN DOCUMENT TO PRODUCE DIGITAL REPRESENTATION
RECOGNIZE SYMBOLIC IDENTIFIER FROM DIGITAL REPRESENTATION
DELETE DIGITAL DATA WITHIN PREDETERMINED AREA POSITIONED WITH RESPECT TO SYMBOLIC IDENTIFIER
GENERATE A CORESPONDENCE BETWEEN SYMBOLIC IDENTIFIER AND AN ENTRY IN A SYMBOL LIBRARY
SUBSTITUTE DIGITAL REPRESENTATION OF LIBRARY SYMBOL FOR DELETED DIGITAL DATA WITHIN PREDETERMINED AREA

3,930,238
DIGITAL APPARATUS

Willard W. McLeod, Jr., Lexington, and John F. Heaton, Acton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 25, 1974, Ser. No. 464,076
Int. Cl.² G11C *13/00*
U.S. Cl. 340—173 R **6 Claims**



1. Digital apparatus for producing a set of pulses having time durations in accordance with corresponding digital words applied sequentially to such digital apparatus comprising:

a. addressable memory means having storage cells arranged in rows and columns;

b. means for applying a control bit to a different one of the columns of storage cells synchronously as each one of the digital words is applied to the digital apparatus;

c. means for enabling storage of such control bit in the row addressed by such applied one of the digital words;

d. a plurality of pulse generating means, each one thereof being coupled to a common actuating line and having a terminating line connected to a corresponding one of the columns of storage celis, each one thereof initiating one of the set of pulses in response to a signal being applied to the actuating line and for terminating such one of the pulses in response to a signal being applied to the terminating line;

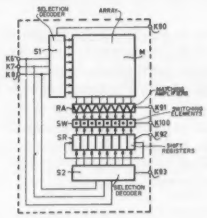
e. means, actuated in response to the last one of a predetermined number of applied digital words, for sequentially reading each one of the rows of storage cells and for applying a signal to the actuating line to initiate simultaneously each one of the set of pulses; and,

f. means for applying signals to a different one of the terminating lines in response to the reading of a different one of the stored control bits thereby to terminate a different one of such pulses at times corresponding to the successively applied digital words.

3,930,239
INTEGRATED MEMORY

Roelof Herman Willem Salters; Lieuwe Boonstra, and Cornelis Willem Lambrechtse, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,222
Claims priority, application Netherlands, July 11, 1973, 7309642
Int. Cl.² G11C *7/00, 8/00*
U.S. Cl. 340—173 R **5 Claims**



1. An integrated solid-state memory, comprising

a memory array for storing information in memory locations defined by rows and columns;

row selection members for selecting a row of said array under control of a first selection instruction signal;

a matching amplifier operatively associated with each of said columns;

switching means for outputting selected information to an information transfer line;

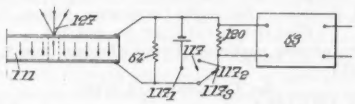
bit selection means, comprising bit selection members for selecting a bit location within an array row under control of a second selection instruction signal, and a shift register connected between said switching means and said bit selection members, said shift register being settable by said second selection instruction signal to a predetermined bit address; and

instruction signal input terminals for supplying to both said row selection members and said bit selection members said first and second selection instruction signals.

3,930,240
FERROELECTRIC MEMORIES AND METHOD OF ACTIVATING THE SAME

Armand Hadni, Nancy, and Robert Thomas, Saint Die, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 273,531, July 20, 1972, Pat. No. 3,820,088. This application Mar. 25, 1974, Ser. No. 454,616
Claims priority, application France, July 23, 1971, 71.27044; Dec. 17, 1973, 73.44966
Int. Cl.² G11C *11/22, 11/42*
U.S. Cl. 340—173.2 **14 Claims**



14. A ferroelectric memory comprising a thin plate formed of a ferroelectric material and metallized directly on its two large faces, means for applying, at will, an erasing voltage

between these two faces in order to polarize all the domains in the same direction, means for concentrating the spot of a laser beam directly on one of the two metallized faces of the plate and to scan said face point by point with this spot, and means for reading information written on said memory, comprising means for applying between said two faces on writing, a voltage of the same sense as the erasing voltage, the energy introduced by the spot of the laser beam at each point of said face of the plate being at least equal to a given value, this energy being adapted to create a polarization gradient for generating an electric field adapted to produce an irreversible switching of the polarization of the domain situated under said point.

3,930,241

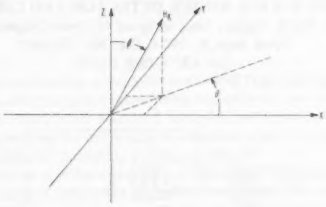
TAILORED ANISOTROPY MAGNETIC BUBBLE DOMAIN MATERIAL

C. Richard Guarnieri, San Jose; Kenneth Lee, and Aare Onton, both of Saratoga, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,329

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **10 Claims**



1. A film of magnetic amorphous material capable of supporting bubble domains comprising:

a region having a canted direction of magnetic uniaxial anisotropy, said canting direction defined by angles ϕ and θ, where $0 < \phi < 90°$ and defines the angle of canting measured from the perpendicular to the plane of the film, and where $0 \leq \theta \leq 360°$ and defines the angle of orientation of the projection of the canting in the plane of the film as measured from an arbitrary line.

3,930,242

MAGNETIC DEVICE HAVING DOMAINS

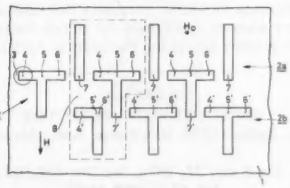
Willem Frederik Druyvesteyn, and Jan Willem Frederik Dorleijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,741

Claims priority, application Netherlands, Mar. 13, 1973, 7303465

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **2 Claims**



1. Magnetic device comprising at least one thin layer of a magnetisable material having a uniaxial anisotropy field and preferred direction of magnetisation which is substantially at right angles to the surface of the layer, means for maintaining magnetic domains in said layer, means for moving the domains, a domain positioning structure having first and second parts, and means for producing a uni-directional magnetic field of constant solarity substantially in the plane of the layer for moving a domain parallel to the axis of said magnetic field from the first part of the domain positioning structure to the second part of the domain positioning structure.

3,930,243

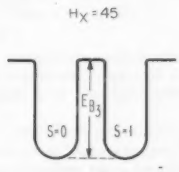
METHOD AND APPARATUS FOR STABILIZING A BUBBLE DOMAIN SYSTEM

Ta-Lin Hsu, and Hung Liang Hu, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1974, Ser. No. 518,026

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **9 Claims**



1. A method of stabilizing a bubble domain system having a magnetic layer exchange coupled to a medium containing bubble domains having no Bloch lines and bubble domains having a pair of Bloch lines comprising the steps of

continuously applying an in-plane magnetic field to said magnetic layer, said magnetic field having a magnitude greater than 0 oersteds and less than that required to obtain a first bubble domain having a pair of Bloch lines when the wall of said first bubble domain is moved with a velocity sufficient to cause magnetic orientation instability therein.

3,930,244

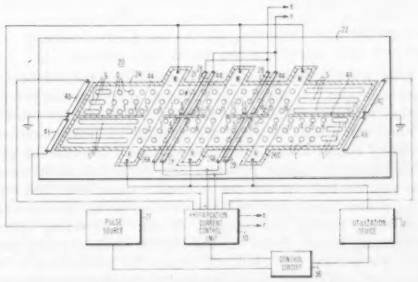
BUBBLE DOMAIN LATTICE BUFFER ARRANGEMENT

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armond, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,940

Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **23 Claims**



1. A combination for maintaining the integrity of a bubble domain lattice having an enclosed plurality of bubble domains in rows and columns on a medium supporting bubble domains, said combination comprising:

a column of stripe domains established on each end of the lattice, one pair for each row of bubble domains in the lattice; and

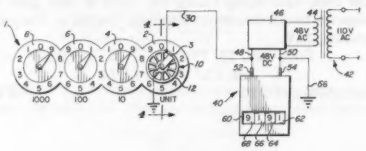
adjusting means for expanding and contracting, at opposite ends, the length of each pair of said stripe domains in accordance with the required propagation direction of its row of bubble domains.

3,930,245

REMOTE MONITOR APPARATUS FOR METERS

Eugene M. Taylor, 3913 W. Windsor Ave., Phoenix, Ariz. 85009

Filed Feb. 5, 1975, Ser. No. 547,226
Int. Cl.² G08C *19/16*
U.S. Cl. 340—188 R **4 Claims**



1. Apparatus for the remote monitoring of a meter having at least a single clock face with a plurality of numerals thereon and a rotatable pointer secured to a shaft, comprising, in combination:

an insulator disposed on the clock face;

conductive wheel means secured to the insulator, including a plurality of spaced apart spokes corresponding to the numerals on the clock face;

wiper means secured to the shaft and making electrical contact with the spokes of the conductive wheel means in response to rotation of the shaft; and

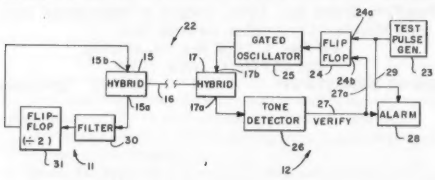
remote indicator means including dial means indicating electrical contact between the wiper means and the conductive wheel means.

3,930,246

ELECTRICAL ALARM SYSTEM

Scott V. Campbell, Melbourne, Fla., assignor to Francis A. Scott, Daytona Beach, Fla.

Filed Jan. 13, 1975, Ser. No. 540,537
Int. Cl.² G08B *25/00*
U.S. Cl. 340—214 **13 Claims**



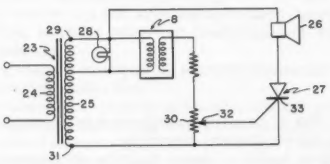
1. In a monitoring system for monitoring from a central station at least one condition occurring in at least one remote station, said system having communication means for transfer of electrical signals between said central and remote stations, coupling means at said central and remote stations for coupling electrical signals between said communication means and said central and remote stations respectively, said coupling means having transmit and receive ports, an improved system for testing the integrity of said monitoring system comprising means at the central station for generating periodic test pulses, test oscillator means for generating a first frequency test signal, oscillator control means for turning said oscillator means on and off so that the oscillator means will oscillate while on and cease to oscillate while off, said oscillator control means being responsive to pulses from said test pulse generating means to turn said oscillator means on, means for conducting said first frequency test signal to the transmit port of said coupling means at said central station whereby said test signal is coupled to said communication means and conveyed to the receive port of said remote station, means at said remote station responsive to said test signal to produce a second frequency signal different from said test signal, circuit means for conducting said second frequency signal to the transmit port of said coupling means at said remote station whereby said second frequency signal is coupled to said communication means and conveyed to the receive port of said central station, a first detector means responsive to said second frequency signal for producing a verify signal when said second frequency signal is detected, said control means being responsive to said verify signal for turning said oscillator means off, an alarm for alerting an operator whenever a verify signal fails to be produced within a predetermined time period after each test pulse, said alarm having means for actuating said alarm in response to a test pulse signal after a time delay equal to said predetermined time period and means responsive to said verify signal for blocking the actuation of said alarm when the verify signal is received within said predetermined time period, said predetermined time period being equal to at least the propagation delay time within the testing system which is measured from the time each test pulse is generated until a second frequency signal can normally be detected by said detector means.

3,930,247

OPEN SCREEN SMOKE DETECTOR AND CIRCUIT

Gordon Hurd, Toney, Ala., assignor to Avco Corporation

Filed Sept. 6, 1974, Ser. No. 503,607
Int. Cl.² G08B *17/10*
U.S. Cl. 340—237 S **1 Claim**



1. In a smoke detector of the variable resistive type the combination of:

a variable resistive sensing element,

a screen for mechanically protecting that element and having a mesh parameter such as to contain flash fires internally without impairing sensitivity to smoke or restricting the flow of air,

said parameter being not more than 20 vertical wires and 20 horizontal wires per flat square inch,

a source of energy,

a warning device,

a silicon control rectifier having a gate and also having an anode-cathode circuit in series with said warning device and said source of energy, and

a control circuit including said resistive element, said control circuit having an input coupled to said source and an output coupled to said gate element in such manner that the presence of smoke decreases the resistance of the resistive element and causes the silicon control rectifier to fire, thereby energizing the warning device.

3,930,248

IMPACT SENSING DETECTOR

Michael I. Keller, 1935 Hawthorne Ave., Alexandria, Va. 22311

Filed July 22, 1974, Ser. No. 490,503
Int. Cl.² G08B *23/00*
U.S. Cl. 340—267 R **11 Claims**

1. An apparatus for monitoring the operation of a mechanical press having relatively movable members including tool-

ing, said members operating to close upon each other to thereby form a workpiece into a desired part comprising:

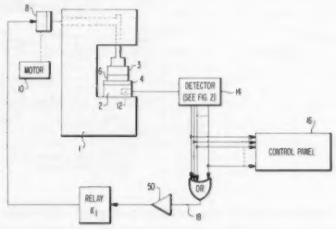
a. means for detecting the shock wave produced as the said members close upon each other,

b. means for sampling the detected shock wave to produce a plurality of amplitude samples of said shock wave over time,

c. means for storing each of said samples of the detected shock wave,

d. means for producing standard samples representing samples of a shock wave produced when the press is operating normally,

e. means for storing said standard samples,



f. a first arithmetic means for electrically and successively comparing time-corresponding samples of the detected shock wave and standard samples to produce signals representing the difference in amplitude between each set of compared samples,

g. means for storing a plurality of electrical representations of standard difference signals representing the permissible difference between each set of compared samples,

h. means for electrically and successively comparing each difference signal with its corresponding standard difference signal, and

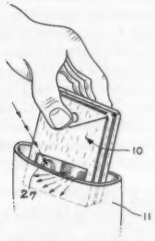
i. means for producing a warning indicator signal when the value of at least one of said difference signals is greater than or less than its corresponding standard difference signal by a predetermined amount.

3,930,249

SELF ACTUATING WALLET ALARM

Howard A. Steck, 458 S. Stuart, Palatine, Ill. 60067, and Ronald J. DiVito, 324 S. Dale St., Arlington Heights, Ill. 60004

Filed June 21, 1974, Ser. No. 481,531
Int. Cl.² G08B *21/00*
U.S. Cl. 340—280 **10 Claims**



1. A wallet alarm device comprising:

an alarm system including alarm means operative to produce an alarm signal;

a case having a portion thereof for retaining said alarm means; and

said alarm system including receiving means responsive to sense pre-selected variations of electromagnetic radiation and effective to actuate said alarm means to product said alarm signal upon sensing said pre-selected variation of electromagnetic radiation; and

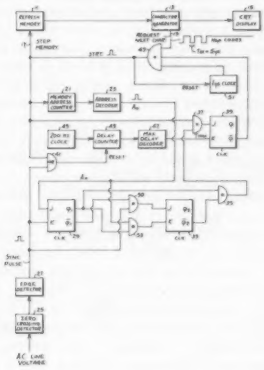
said alarm system comprising an electronic circuit having a pair of quasi-complementary coupled transistors coupled between said receiving means and said alarm means to provide a high out put to said alarm means notwithstanding substantial impedance mismatching between said circuit and said alarm means.

3,930,250

SYNCHRONIZING SYSTEM FOR REFRESH MEMORY

Walter T. Blejwas, Jr., Somerville, N.J., and Peter D. Dickinson, Monte Sereno, Calif., assignors to Vydec, Inc., Whippany, N.J.

Filed May 6, 1974, Ser. No. 467,270
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 A **10 Claims**



1. In a system for producing characters of a page of text on a display from a dynamic recirculating refresh memory, a method for synchronizing the system to the power line frequency to prevent movement of the display, the method comprising:

stepping said refresh memory from character to character at a predetermined slow clock rate until a power line synchronizing pulse occurs, wherein the time interval T_{max} between each clock pulse is longer than the time required to produce the most complex character to be displayed; and

stepping said refresh memory at variable clock rates after said synchronizing pulse occurs until all characters of a page are produced on the display, wherein a clock pulse occurs in response to the completion of each character displayed.

5. A synchronizing system comprising:

means for producing periodically recurring sync pulses;

a dynamic recirculating refresh memory for storing a plurality of characters in coded form, said memory having a control input for stepping said memory from one memory location to the next to output the characters in sequence;

a character generator coupled to the output of said refresh memory for producing characters in a manner for display, said character generator having an output indicating when the generation of each character is complete;

means for sensing the beginning of each recirculation of said refresh memory;

first means coupled to the control input of said memory for stepping said memory at predetermined long time intervals T_{max} which are longer than the time required to generate the most complex character to be displayed;

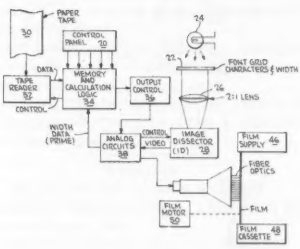
second means coupled to the control input of said memory and to said character generator output for stepping said memory at varying time intervals in response to the generation of each character; and

control means responsive to said sync pulse producing means and said sensing means for enabling said first stepping means at the beginning of a memory refresh cycle and for thereafter disabling said first stepping means and enabling said second stepping means when a sync pulse occurs.

3,930,251
CHARACTER IMAGE GENERATION APPARATUS AND CRT PHOTOTYPESETTING SYSTEMS

Roger F. Salava, Andover, Mass.; Brian G. Eastman, Hampstead, N.H., and George W. King, Concord, Mass., assignors to Compugraphic Corporation, Wilmington, Mass.

Filed May 9, 1974, Ser. No. 468,534
Int. Cl.² G08B 5/36
U.S. Cl. 340—324 AD **13 Claims**



1. Apparatus for printing text by converting encoded electrical signals into printed characters, comprising:

means for generating electron images of characters to be printed from said coded input signals and including an arrangement of characters with indexing bars forming a character field for each of said characters;

means for controlling said means for generating electron images to select characters from said arrangement of characters in accordance with a desired character format; said means for generating electron images further including means for deflecting said electron images in accordance with a predetermined scanning pattern in response to said means for controlling, said scanning pattern having first and second different scanning rasters wherein said first scanning raster scans at least one of said indexing bars and said second scanning raster scans said character associated with said at least one indexing bar, and means for producing output signals representative of said electron images;

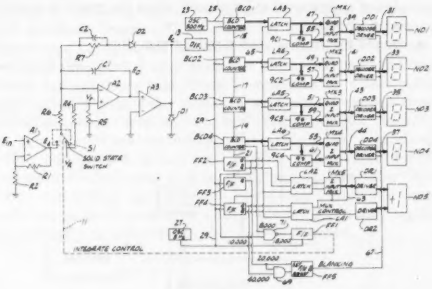
first means responsive to said output signals for correcting the position of said first scanning raster to improve the initial position of said second scanning raster for scanning a selected character, said first means including means for selectively varying the rate of said position correction during said first scanning raster; and

second means responsive to said output signals for generating a visual image of said characters in accordance with said second scanning raster and including means for recording said visual image.

3,930,252
BIPOLAR DUAL-SLOPE ANALOG-TO-DIGITAL CONVERTER

Robert C. Storar, Xenia, Ohio, assignor to United Systems Corporation, Dayton, Ohio

Filed Dec. 26, 1973, Ser. No. 427,953
Int. Cl.² H03K 13/20
U.S. Cl. 340—347 NT **27 Claims**



1. A bipolar dual-slope analog-to-digital converter system for converting an analog input signal of unknown polarity to a decimal number which is directly proportional to said analog input signal, said system comprising:

a. an integrator for providing an output signal which is proportional to the time integral of the magnitude with respect to a single analog reference of preselected magnitude and polarity of signal applied to the input thereof;

b. solid state switching means for alternately connecting to the input of said integrator either a first signal corresponding to an analog input signal of unknown magnitude and of either positive or negative polarity or a second signal constituting said single analog reference;

c. a pulse generator for supplying pulses at a substantially constant pulse repetition rate;

d. a digital counter for counting said pulses;

e. automatic means for effecting determination of the polarity of said analog input signal without polarity sensing of said analog input signal and for effecting display of a decimal number which is directly proportional to said analog input signal regardless of the polarity thereof, said automatic means comprising:

1. means for resetting said counter to a predetermined first count and for causing said switching means to apply one of said first and second signals to the input of said integrator whereby the output signal from said integrator increases linearly with respect to time from a reset value while said counter advances from said first count to a predetermined second count;

2. means responsive to said second count for causing said switching means to apply the other of said first and second signals to the input of said integrator whereby the output signal from said integrator decreases linearly with respect to time toward said reset value while said counter advances from said second count toward a predetermined third count, said reset value being reached prior to said third count if said first signal is of a first polarity and said reset value being reached after said third count if said first signal is of opposite polarity;

3. digital display means;

4. complement count means for causing said digital display means to display a decimal number corresponding to the complement of the count in said counter upon the output signal from said integrator reaching said reset value prior to said third count; and

5. true count means responsive to said counter reaching said third count for causing said digital display means

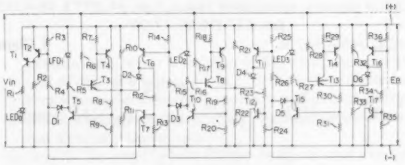
to display a decimal number corresponding to the true count in said counter upon the output signal from said integrator reaching said reset value, whereby the decimal number displayed by said display means digitally represents the true magnitude of said analog input signal regardless of the polarity thereof.

3,930,253

CIRCUIT FOR CONVERTING AN ANALOG INPUT SIGNAL VOLTAGE INTO A DIGITAL REPRESENTATION

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 24, 1974, Ser. No. 436,170
Claims priority, application Japan, Feb. 1, 1973, 48-12452
Int. Cl.² H03K *13/175*
U.S. Cl. 340—347 AD **7 Claims**



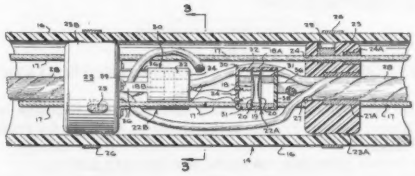
1. A circuit for converting an analog input signal from an analog signal source to a digital representation comprising a plurality of electrically sequential switching means (T_3, R_{10}, R_{11}, T_4, T_5; T_8, R_{21}, R_{22}, T_9, T_{10}; T_{13}, R_{32}, R_{33}, T_{14}, T_{15}) which have different detecting voltages, each of said switching means generating a detecting signal when an analog input signal voltage from said analog signal source equals a detecting voltage, a plurality of electrically sequential operating means (T_6, D_5; T_{11}, D_4; T_{16}, D_6; T_7, T_{12}, T_{17}) for preventing an analog input current from said analog source from flowing into said plurality of switching means, each of said plurality of operating means being actuated upon application of a detecting signal from the sequentially preceding switching means and the thus actuated operating means actuating the following sequentially operating means.

3,930,254

SEISMIC STREAMER CONSTRUCTION FOR MINIMIZING HYDROPHONE RESPONSE TO VIBRATION PRODUCED PRESSURE FIELDS

George M. Pavey, Jr., Dallas, Tex., assignor to Whitehall Corporation, Dallas, Tex.

Filed Apr. 9, 1974, Ser. No. 459,326
Int. Cl.² G01V *1/16*
U.S. Cl. 340—7 R **3 Claims**



1. A marine seismic streamer section for an elongated seismic streamer made up of plural sections serially connected together, the streamer section comprising an elongated streamer jacket of generally cylindrical tubular configuration of predetermined inner and outer diameter concentric with a streamer axis including signal wires and strain cables extending through the interior thereof, an array of hydrophone units in the streamer section arranged in closely adjacent pairs of associated hydrophone units to respond to accoustic pressure variations originating externally of the streamer section and produce electrical output signals, means connecting the output signals from each associated pair of hydrophone units in additive relation to provide an added pair output; and means supporting the hydrophone units of each associated pair within said jacket in a manner to effect cancellation in the added pair output from the pair of associated units of unwanted output signals resulting from sound pressure fields produced by vibratory motion of the components forming the streamer section, comprising a pair of cylindrical bodies forming piston members concentric with said streamer axis having an outer diameter corresponding substantially to the inner diameter of said jacket tightly fitted therein and having apertures therethrough through which said strain cables and signal wires pass in tightly fitted relation, sealing means substantially sealing said piston members against the surfaces of said wires and cables and against said jacket to substantially prevent leakage of sound pressure fields travelling in the streamer section into the space between the associated pair of piston members, means firmly securing said piston members to said strain cables passing therethrough, and a pair of spaced hydrophone mounting members fixedly located in said space between the pair of piston members fixed on mounting faces of said respective piston members of said pair transverse to said streamer axis which face inwardly toward said space and confront each other, said mounting members supporting said hydrophone units in fixed spaced relation to their associated mounting faces of the piston members, whereby motion imparted to said mounting faces caused by vibratory motion of the streamer components is substantially identical in phase, amplitude and frequency at both faces producing identical sound fields of opposite sign which activate the pair of hydrophone units to produce opposite sign signals which cancel each other in said added output, each of said mounting members being a rigid body having a cylindrical cup-shaped portion spaced from the mounting face of the supporting piston and encircling the associate hydrophone unit in peripherally supported relation therein at the axial center thereof and having sound pressure communicating apertures in the end wall more remote from the associated mounting face, and said rigid body including plural legs extending integrally from the cup-shaped portion in concentric parallelism with the streamer axis to the associated mounting face and being fastened rigidly thereto.

3,930,255

ANALOG TO DIGITAL CONVERSION BY CHARGE TRANSFER DEVICE

Robert W. Means, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1974, Ser. No. 440,215
Int. Cl.² H03K *13/06*
U.S. Cl. 340—347 AD **1 Claim**

1. An analog to digital converter employing a charge transfer matrix comprising:

a semiconductor substrata for storage of charge regions representing the analog signal and other comparison signals;

a plurality of electrodes cooperatively positioned in four linear channels of $2N - 1$ cells, where N is the number of digital bits required in the digital answer, individual cells being defined by the physical extend of the associated electrode and being numbered from one commencing with the input cell;

a first one of said electrode channels includes electrodes shaped to provide only full charge transfer cells to provide a channel for storage and transfer of the analog signal and for addition of signal thereto;

a second one of said electrode channels arranged adjacent said first electrode channel including odd-numbered full charge transfer cells and alternate even-numbered charge

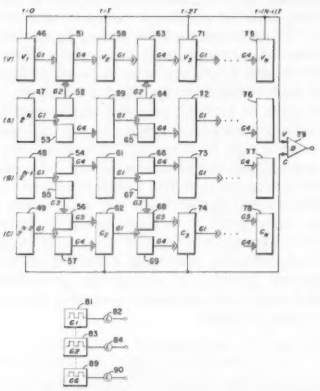
division cells whereby the initial charge placed therein is reduced to successively approximate the charge in said first channel upon sequented charge transfer;

a third one of said four electrode channels positioned on the opposite side of said second electrode channel from said first electrode channel and including alternate, oddnumbered full charge transfer cells and even-numbered charge division cells for establishing a comparison voltage channel;

a fourth one of said four electrode channels positioned on the opposite side of said third electrode channel from said second electrode channel and including alternate oddnumbered full charge transfer cells and even-numbered charge division cells for cooperation with said third one of said four electrode channels;

a first series of charge transfer gates extending between and for moving charges between odd and even numbered cells in each channel;

a second series of charge transfer gates arranged to extend between one of each pair of said charge division cells in said second one of said electrode channels and an adjacent, even-numbered full charge transfer cell in said first one of said electrode channels for charge transfer therebetween whereby a charge from said charge division cells may be added to the charge within said analog signal channel;



a third series of charge transfer gates arranged to extend between one of each pair of said even-numbered charge division cells in said third electrode channel and one of each pair of even-numbered charge division cells in said fourth electrode channel for charge transfer therebetween for charge transfer and addition therebetween;

a fourth series of charge transfer gates arranged to extend between each of said even-numbered and said odd-numbered cells in said first electrode channel and between each of the other even-numbered charge division cells in said second, third, and fourth electrode channels and the odd-numbered cells therein for charge transfer therebetween;

a fifth series of charge transfer gates arranged to extend between said one of each pair of said even-numbered charge division cells and said odd-numbered full charge transfer cells in said third electrode channel for charge transfer therebetween;

logic controlled clocking circuit means connected to each of the aforerecited charge transfer gates for effecting a timely migration of electrical charges between the associated cells in dependence on the charge potential therebetween; and

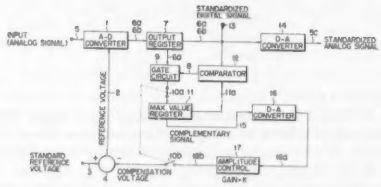
differential amplifier means connected between the odd-numbered full charge transfer cells in said first electrode channel and the odd-numbered full charge transfer cells in said fourth electrode channel for producing an output when a predetermined difference exists therebetween whereby a digital word output results in dependence upon the particular charge migrations established by the said first through fifth series of charge transfer gates and logic controlled clocking circuit means as the charge in the fourth electrode channel is processed to approximate the analog signal input of the first electrode channel.

3,930,256

DEVICE FOR STANDARDIZING A MAXIMUM VALUE OF AN OUT-PUT SIGNAL CORRESPONDING TO AN INPUT ANALOG SIGNAL

Hiroshi Amemiya, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 8, 1974, Ser. No. 459,042
Claims priority, application Japan, Apr. 14, 1973, 48-42335
Int. Cl.² H03K *13/00*
U.S. Cl. 340—347 R **4 Claims**



1. A device for standardizing the maximum value of an output signal corresponding to an input analog signal, comprising an analog-digital converter for converting an input analog signal into digital signals in a manner to correspond to a standard reference voltage or a compensated reference voltage; an output register for storing the output digital signal of the analog-digital converter for each predetermined period corresponding to a sampling period of the analog-digital converter and for permitting the stored signal to be read out therefrom; a first means for storing through the output register the maximum-valued one of the digital signals from the analog-digital converter which corresponds to the standard reference voltage, and for producing a complementary signal of the maximum-valued digital signal; a second means for converting the complementary signal into an analog signal and producing a compensation voltage; and a third means for supplying, after lapse of an initiating period, to the analog-digital converter, a compensated reference voltage obtained through the subtraction of the level of the compensation voltage from the level of the standard reference voltage, to obtain from the analog-digital converter an output whose maximum value is standardized to a predetermined level.

3,930,257

METHODS OF AND APPARATUS FOR ELECTROSTATIC PRINTING

Pham Kim Quang, Dieppe, and René Gasdoué, Neuville les Dieppe, both of France, assignors to La Cellophane, Paris, France

Filed Mar. 18, 1974, Ser. No. 452,346
Claims priority, application France, Apr. 3, 1973, 73.11867
Int. Cl.² G03G *15/18*
U.S. Cl. 346—74 ES **12 Claims**

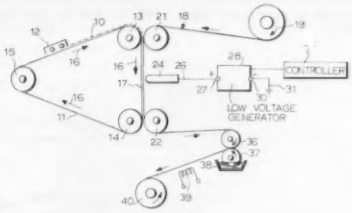
1. An apparatus for electrostatic printing on a strip of material, wherein said material includes an insulating support layer with a dielectric layer thereupon, the dielectric layer having an interior surface and an exterior surface, said apparatus comprising:

means for locating the material at a printing station;

means for depositing a uniform field of electrostatic charges

in the insulating support layer, wherein the charges have a level of potential which is below a threshold ionization level;

stylet means for creating the charge image, said stylet means being located in said printing station, wherein said stylet means is brought to a predetermined level of potential



substantially lower than that of the electrostatic charges and of opposite polarity, but high enough to cause ionization when added to the potential level of said charges to thereby transfer a charge image to the exterior surface of the dielectric layer; and

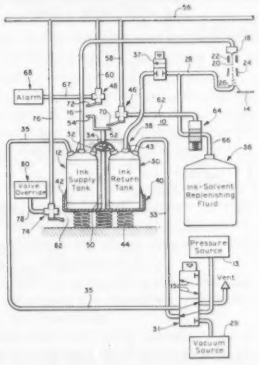
means for developing said charge image to make the image visible.

3,930,258

INK MONITORING AND AUTOMATIC FLUID REPLENISHING APPARATUS FOR INK JET PRINTER

George H. Dick, Highland Park, and Thomas J. Madden, Jr., Elk Grove Village, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Jan. 13, 1975, Ser. No. 540,394
Int. Cl.² G01D *18/00*
U.S. Cl. 346—75 **9 Claims**



1. An ink supply arrangement for an ink jet printing apparatus including in combination:

pressurized ink supply tank means connectable to an ink jet nozzle from which ink drops are projected toward a record medium, for supplying ink under pressure to said nozzle;

ink return tank means connectable to ink catcher means, for storing ink drops not used in the printing process, said ink return tank means being evacuated to provide a force for drawing ink drops from said catcher means to said ink return tank means;

container means having a supply of ink replenishing fluid therein, said container means being coupled to said return tank means for communication therewith, whereby replenishing fluid is drawn from said container means to said return tank means; and

ink monitoring and fluid replenishing apparatus for adding automatically replenishing fluid from said container means to said return tank means when necessary to increase the volume of liquid in said supply and return tank means to a predetermined volume, said apparatus including:

means for sensing the total volume of liquid in both said supply and return tank means,

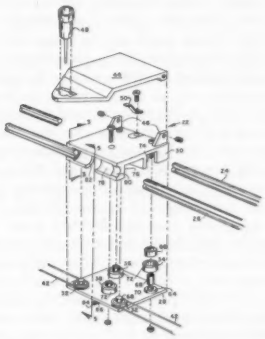
normally closed valve means interposed between said fluid replenishing container means and said return tank means, switch means coupled to said valve means and being actuable for operating said valve means to an open condition, said switch means being actuated by said volume sensing means upon said volume of liquid in said supply and return tank means decreasing to a predetermined volume, whereby replenishing fluid is drawn from said container means to said return tank means, said switch means being deactuated when said liquid volume is increased predeterminedly.

3,930,259

SLIDING STYLUS HOLDER FOR AN X-Y PLOTTER

David Orville Hoskins, Beaverton, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Filed Apr. 22, 1974, Ser. No. 463,012
Int. Cl.² G01D *15/24*
U.S. Cl. 346—139 R **9 Claims**



1. A stylus holder for sliding movement along guide rods of a recorder apparatus for recording information on a recording medium thereon, said stylus holder comprising:

a mounting member;

roller members mounted on mounting means arranged in parallel provided by said mounting member with said roller members being arranged in a triangular configuration for rolling engagement with one of the guide rods, each of said roller members having an arcuate area that provide minimal contact areas with the one of the guide rods thereby minimizing frictional engagement therebetween;

groove means provided by said mounting member for engagement with another of the guide rods, said groove means having bearing means that engage the another of the guide rods thereby minimizing frictional engagement therebetween;

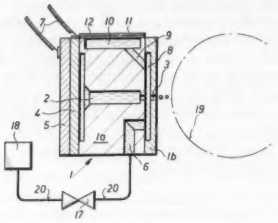
means provided by said mounting member for engagement by operating means to slidably move the stylus holder along the guide rods; and

plate means pivotally mounted on said mounting member for carrying a stylus member for recording information on the recording medium.

3,930,260
APPARATUS FOR APPLYING A LIQUID IN DROPLETS TO A SURFACE

Heinrich Sicking, Grafschaft, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed May 3, 1974, Ser. No. 466,862
Claims priority, application Germany, May 9, 1973, 2323220
Int. Cl.² G01D 15/16
U.S. Cl. 346—140 2 Claims



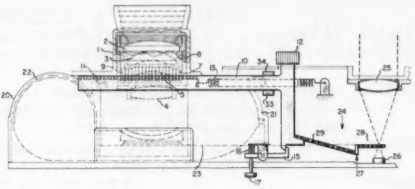
1. In an apparatus for applying a liquid in droplets to a surface, including an ejection head having means forming a pressure chamber in the ejection head, means forming a discharge channel in the ejection head, the discharge channel communicating with the pressure chamber, means forming an inlet channel in the ejection head, the inlet channel communicating with the pressure chamber, the apparatus further including a reservoir for the liquid, conduit means coupling the reservoir with the inlet channel for supplying the pressure chamber with liquid and a device connected to the ejection head for effecting momentary pressurizations of the liquid in the pressure chamber, shutoff means in the conduit means, the shutoff means having an open position for maintaining communication between the reservoir and the ejection head in the operating state of the apparatus, the shutoff means having a closed position for blocking communication between the reservoir and the ejection head in the non-operating state of the apparatus, the improvement comprising a pressure equalizing device including wall means bounding and defining a pressure equalizing chamber entirely filled with the liquid, said pressure equalizing chamber being in communication with said pressure chamber, at least one portion of said wall means being constituted by a first plate deformable for varying the volume of said pressure equalizing chamber, said first plate being attached to said ejection head and being responsive to the temperature of the liquid in said pressure chamber and in said pressure equalizing chamber; a second plate affixed rigidly face-to-face to said first plate; the material of said first plate having a coefficient of thermal expansion that is smaller than that of said second plate for increasing and, respectively, decreasing said volume upon expansion and, respectively, contraction of the liquid in said ejection head in said closed position of said shutoff means.

3,930,261
AUTOMATIC FOCUS APPARATUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1974, Ser. No. 500,868
Int. Cl.² G03B 7/08
U.S. Cl. 354—25 8 Claims

1. Optical focusing structure for a camera including a taking lens, said taking lens being adjustable through a range of positions from substantially an extended position to substantially an infinity position, a spatial frequency filter, a fixed focus lens, said fixed focus lens providing imaging light ray components in the region of said filter from a subject to be photographed, means coupled to said taking lens and to said filter and operable on command to move said taking lens progressively between the last-mentioned two positions and simultaneously to move said filter in a first direction through said components to chop the latter, and in a second direction along said components to scan for the position of the subject image produced by said components, light sensitive detector means positioned to receive said components and to produce a detector signal of a frequency dependent upon the rate at which said filter chops said components, and of a value which reaches a maximum when said motion of said filter in said

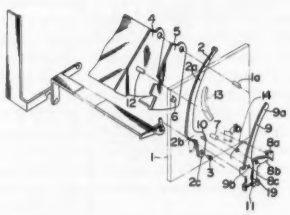


second direction causes said filter to intercept said image, peak detecting means connected to said detector means and responsive to the value of said detector signal to produce a stop signal when said value reaches said maximum, and means connected to said peak detecting means and responsive to said stop signal to stop the adjustment of said taking lens at its then position of adjustment upon the receipt of said stop signal, the last-mentioned position of said taking lens causing the latter to focus an image of said subject on a film plane of the camera.

3,930,262
SHUTTER SPEED CONTROL MEANS

Susumu Fujita, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Apr. 18, 1974, Ser. No. 462,059
Claims priority, application Japan, Apr. 23, 1973, 48-46516
Int. Cl.² G03B 17/40
U.S. Cl. 354—267 3 Claims



1. In a camera having first and second shutter curtains pivotally mounted within a housing, the improved shutter speed control means comprising:

a. a single-piece, shutter retaining member pivotally attached to said housing and engaging said second shutter curtain to retain said second shutter curtain in a first position,

b. a first lever pivotally attached to said housing at one end,

c. a second lever pivotally attached to said first lever, a first end of said second lever engaging said shutter retaining member,

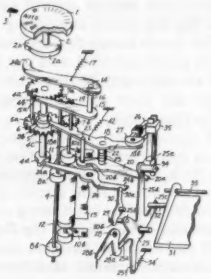
d. a pin attached to said first shutter curtain passing through an arcuate slot in said housing, said pin being engageable with a second end of said second lever, and

e. spring means connecting said shutter retaining member and said first end of said second lever.

3,930,263
CAMERA HAVING A SHUTTER MECHANISM CONTROLLED TO REMAIN CLOSED AS A FAILURE WARNING

Fumio Urano, Omiya, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1974, Ser. No. 500,669
Claims priority, application Japan, Aug. 27, 1973, 48-96012
Int. Cl.² G03B 17/38
U.S. Cl. 354—268 7 Claims



1. In a single lens reflex camera having an actuating member, a mirror for reflecting light passing through the single lens to enable composition and focusing when the mirror is in a picture-composing position, the mirror being pivoted for rotation from its picture-composing position to a picture-taking position whereat it does not reflect the light, a shutter mechanism of the type which includes simultaneously chargeable and separately releasable leading and following shutter screens, and electromechanical means which when operable is operative upon movement of the actuating member to release the leading shutter screen and thereafter temporarily to hold and then release the following shutter screen so as to define an exposure slit as the released leading shutter screen moves ahead of the following shutter screen, said electromechanical means including an electromagnet and an armature magnetically attracted thereto when the electromagnet is operated in connection with the operation of holding the following shutter screen, the improvement for providing a warning that said electromechanical means is not operable, which comprises:

means for moving the mirror from its picture-composing position to its picture-taking position so that until said electromechanical means has completed its operation light passing through the single lens is not blocked from passing through the exposure slit;

a movable member for supporting the armature;

biasing means for urging the movable member in a direction away from a first position;

means, including said actuating member, for temporarily overcoming the urging of the biasing means so as to place the movable member in the first position during a first time interval in which the shutter screens are charged;

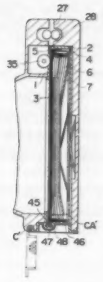
the movable member having a first mode of operation when the electromagnet is operating, in which first mode the movable member is held in the first position owing to magnetic attraction between the armature and the electromagnet, and having a second mode of operation if not so held during a second time interval immediately following the first time interval, in which second mode the movable member moves to reach a second position before the leading shutter screen is released; and

stop means responsive to the movable member operating in the second mode for preventing movement of the leading shutter screen while the mirror remains in its picture-composing position.

3,930,264
FILM CASSETTE

Yoshio Asano, Hyogo, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Apr. 3, 1974, Ser. No. 457,732
Claims priority, application Japan, Apr. 12, 1973, 48-44003; Apr. 3, 1973, 48-38054; Apr. 18, 1973, 48-43986
Int. Cl.² G03B 19/10
U.S. Cl. 354—174 8 Claims

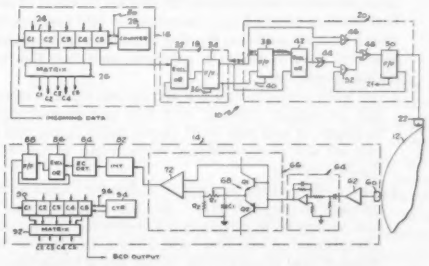


1. A film cassette containing a plurality of film monosheets comprising a lightproof outer case, said case forming a front opening through which monosheets may be exposed, and an exit opening through which exposed monosheets may be removed, a spring means urging said monosheets toward said front opening, a protective lightproof board located in said cassette adjacent said front opening, a strip made of flexible lightproof material with a length equal to that of said exit opening and a width greater than that of said exit opening, one edge of which is attached to the interior of said case adjacent said exit opening and the free end of which covers said monosheet exit opening and is bent by pushing of said board to open said monosheet exit, whereby monosheets in said cassette may be protected from exposure to light through said front opening said lightproof board being removable from and insertable into said cassette through said monosheet exit.

3,930,265
HIGH DENSITY MAGNETIC STORAGE SYSTEM

Noboru Kimura, Gardena, Calif., assignor to VRC California, Inc., El Segundo, Calif.

Filed June 7, 1974, Ser. No. 477,447
Int. Cl.² G11B 5/09
U.S. Cl. 360—45 33 Claims



1. In a high track-density magnetic recording system in which digital information is represented by magnetic flux changes on a magnetic medium, apparatus for maintaining a high integrity recorded signal with high linear bit density comprising:

means for converting an incoming bit stream to a converted bit stream comprising five bit cell fields, each of the five bit cell fields representing a corresponding ordered group

of four bits from the incoming bit stream, the converted bit stream comprising a first bilevel signal having a first level and a second level, and having not more than two cells at the first level adjacent one another;

means responsive to the converted bit stream for generating a second bilevel signal, the second bilevel signal changing from one level to the other level in response to the occurrence of the second level generated by the means for converting, thereby providing a self-clocking signal of known component frequency; and

means coupled to the second bilevel signal generating means for providing a signal in response thereto having a modulated component for minimizing fringing field effects of nearby tracks.

3,930,266

CONTROL SYSTEM FOR A RECORDING/REPRODUCING APPARATUS

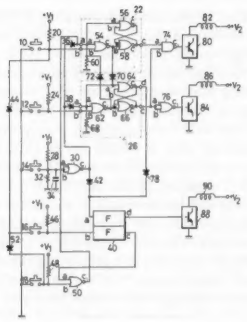
Hiroshi Okamoto, Simoakasaka 689-7, Kawagoe, Saitama, Japan

Filed Jan. 24, 1974, Ser. No. 436,199

Claims priority, application Japan, Jan. 31, 1973, 48-13150

Int. Cl.² G11B *15/12*

U.S. Cl. 360—62 **1 Claim**



1. In a recording/reproducing apparatus of the type including a record medium which can be caused to run in one and the opposite directions as required, a control system comprising, in combination:

a first control switch;

a first flip-flop circuit having a set terminal and a reset terminal and an output terminal, said set terminal of said first flip-flop circuit being connected to said first control switch whereby said first flip-flop circuit is triggered when said first control switch is actuated, said first flip-flop circuit comprising:

a first NOR circuit having first and second input terminals and an output terminal, said first and second input terminals of said first NOR circuit being connected to said set and reset terminals, respectively, of said first flip-flop circuit;

a second NOR circuit having first and second input terminals and an output terminal, said first input terminal of said second NOR circuit being connected to said output terminal of said first NOR circuit, said output terminal of said second NOR circuit being connected to said output terminal of said first flip-flop circuit; and

a third NOR circuit having first and second input terminals and an output terminal, said first input terminal of said third NOR circuit being connected to said reset terminal of said first flip-flop circuit, said second input terminal of said third NOR circuit being connected to said output terminal of said second NOR circuit, said output terminal of said third NOR circuit being connected to said second input terminal of said second NOR circuit;

means connected to said output terminal of said first flip-flop circuit and adapted to condition the recording/reproducing apparatus for the motion of the record medium in said one direction when said first flip-flop circuit is triggered;

a second control switch;

a second flip-flop circuit having a set terminal and a reset terminal and an output terminal, said set terminal of said second flip-flop circuit being connected to said second control switch whereby said second flip-flop circuit is triggered when said second control switch is actuated, said second flip-flop circuit comprising:

a fourth NOR circuit having first and second input terminals and an output terminal, said first and second input terminals of said fourth NOR circuit being connected to said set and reset terminals, respectively, of said second flip-flop circuit;

a fifth NOR circuit having first and second input terminals and an output terminal, said first input terminal of said fifth NOR circuit being connected to said output terminal of said fourth NOR circuit, said output terminal of said fifth NOR circuit being connected to said output terminal of said second flip-flop circuit; and

a sixth NOR circuit having first and second input terminals and an output terminal, said first input terminal of said sixth NOR circuit being connected to said reset terminal of said second flip-flop circuit, said second input terminal of said sixth NOR circuit being connected to said output terminal of said fifth NOR circuit, said output terminal of said sixth NOR circuit being connected to said second input terminal of said fifth NOR circuit;

means connected to said output terminal of said second flip-flop circuit and adapted to condition the recording/reproducing apparatus for the motion of the record medium in said opposite direction when said second flip-flop circuit is triggered;

a first diode connected between said output terminal of said first NOR circuit of said first flip-flop circuit and said reset terminal of said second flip-flop circuit, said first diode being adapted to reset said second flip-flop circuit when said first flip-flop circuit is triggered; and

a second diode connected between said output terminal of said fourth NOR circuit of said second flip-flop circuit and said reset terminal of said first flip-flop circuit, said second diode being adapted to reset said first flip-flop circuit when said second flip-flop circuit is triggered.

3,930,267

PUSH BUTTON RELEASE CONTROL SYSTEM FOR A TAPE RECORDER

Helmut Plener, Munich, Germany, assignor to Uher Werke Munich, Munich, Germany

Filed Feb. 27, 1974, Ser. No. 446,285

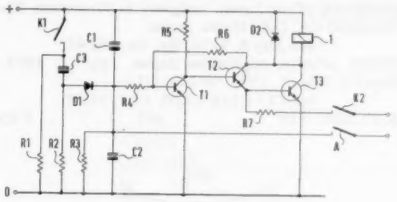
Claims priority, application Germany, Sept. 11, 1973, 2345790

Int. Cl.² G11B *15/10*

U.S. Cl. 360—69 **7 Claims**

1. A push button release control circuit for a tape recorder such as a cassette recorder in which tape is advanced by drive means between a supply reel and a take-up reel and having a plurality of push button switches selectively movable into operable positions for activating the functional operations of the recorder comprising, in combination, normally inoperative, electrically operated means for releasing all of said push button switches from said operative positions, a pair of transistors interconnected in a Darlington stage for connecting said releasing means to an associated source of power in the conducting condition to operatively condition said releasing means, a control transistor connected to said pair of transistors and to said associated source of power, circuit means

connected to said associated source of power for biasing said control transistor into a conducting condition during the advance of said tape to maintain said pair of transistors in a non-conducting condition, said circuit means being responsive



to the stopping of said tape to discontinue the biasing of said control transistor and to permit said pair of transistors to conduct for operatively conditioning said releasing means to release all of said push button switches from said operative positions.

3,930,268

CASSETTE TAPE DECK WITH BRAKE AND TAPE TENSIONING MEANS

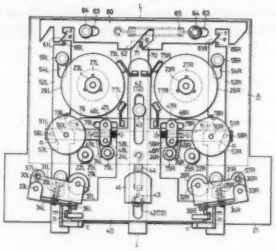
Yasuhiro Uemura, Tokyo, Japan, assignor to Teac Corporation, Musashino, Japan

Division of Ser. No. 263,969, June 19, 1972, Pat. No. 3,864,744. This application May 6, 1974, Ser. No. 466,955

Claims priority, application Japan, June 20, 1971, 46-44082; June 20, 1971, 46-44083; June 20, 1971, 46-44084

Int. Cl.² G11B *15/18;* B65H *23/06*

U.S. Cl. 360—96 **1 Claim**



1. A cassette tape deck for use with a cassette having a magnetic tape wound on a pair of first and second reels having central apertures respectively in a casing, the casing having a first major face having formed therein at least a pair of first and second capstan receiving apertures and a pair of first and second reel drive shaft receiving apertures and a second major face having formed therein at least a magnetic head receiving window and a pair of first and second pinch roller receiving windows and substantially perpendicular to the first major face, comprising a pair of first and second capstans insertable into the first and second capstan receiving apertures; a pair of first and second pinch rollers that make rotary contact with the first and second capstans through the first and second pinch roller receiving windows; a magnetic head mounted on a sliding plate to make contact with the magnetic tape through the magnetic head receiving window; a pair of first and second reel drive shafts insertable into the first and second reel drive shaft receiving apertures; a pair of first and second actuating levers movable along first and second paths respectively, the pair of first and second actuating levers being moved in a first direction along the first and second paths respectively for bringing the first and second pinch rollers into rotary contact with the first and second capstans and for sliding the sliding plate to contact the magnetic head with the magnetic tape; a locking lever for selectively locking the first and second actuating levers at their moved positions in the first direction along the first and second paths; a third actuating lever for releasing the first and second actuating levers from their locked condition to move them along the first and second paths in a second direction reverse to the first direction; a pair of first and second wheels for coupling the first and second reel drive shafts with driving sources through a pair of first and second rotary frictional coupling means, a pair of first and second brake members mounted on the sliding plate, the pair of first and second brake members engaging the first and second wheels respectively to brake them when the sliding plate is not slid, and disengaging from the first and second wheels to release them from the braked condition when the sliding plate is slid; a movable lever adapted to be engageable with the first and second actuating levers and movable in third and fourth directions respectively along a third path; and a pair of third and fourth brake members disposed on the movable lever for engagement with the first and second wheels based upon the actuation of the second and first actuating levers respectively to apply back tension to the magnetic tape through the second and first reel drive shafts.

3,930,269

CASSETTE TAPE DECK WITH TAPE TENSIONING

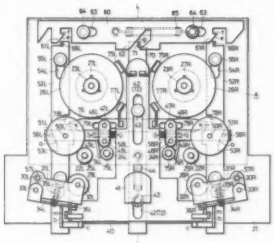
Yasuhiro Uemura, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Division of Ser. No. 263,969, June 19, 1972, Pat. No. 3,864,744. This application May 6, 1974, Ser. No. 467,463

Claims priority, application Japan, June 20, 1971, 46-44082; June 20, 1971, 46-44083; June 20, 1971, 46-44084

Int. Cl.² G11B *19/24*

U.S. Cl. 360—96 **1 Claim**



1. A cassette tape deck for use with a cassette having a magnetic tape wound on a first and second reel having central apertures respectively in a casing, the casing having a first major face having formed therein at least a first and second capstan receiving aperture and a first and second reel drive shaft receiving aperture and a second major face having formed therein at least a magnetic head receiving window and a first and second pinch roller receiving window and being substantially perpendicular to the first major face, comprising a first and second capstans inserted into the first and second capstan receiving apertures, a first and second pinch roller making rotary contact with the first and second capstan through the first and second pinch roller receiving windows, a magnetic head making contact with the magnetic tape through the magnetic head receiving window, a first and a second reel drive shaft inserted into the first and second reel drive shaft receiving apertures, a movable member having mounted thereon the magnetic head, and a first and a second actuating lever movable for actuating the movable member to

urge the magnetic head against the magnetic tape, the first and second pinch rollers being pivoted to first and second pins on the free end of first and second rotary arms journalled to first and second shafts, respectively, the first and second rotary arms are biased by first and second springs respectively and having pivoted thereto third and fourth rotary arms respectively, the third and fourth rotary arms being biased by third and fourth springs respectively towards the first and second rotary arms, the movable means having provided thereon first and second engaging pieces for abuttment with the third and fourth rotary arms respectively, the first and second actuating levers carrying thereon first and second actuating pieces for abuttment with the third and fourth rotary arms respectively, in which, based upon the actuation of the first actuating lever to actuate the movable means to urge the magnetic head against the magnetic tape, the third rotary arm is rotated by the first actuating piece against the third spring and then the first rotary arm is rotated through the third spring against the first spring to bring the first pinch roller into rotary contact with the first capstan, and the fourth rotary arm is rotated by the second engaging piece against the fourth spring through the movable means and then the second rotary arm is rotated by the fourth spring against the second spring to bring the second pinch roller into rotary contact with the second capstan with the contact pressure lower than that of the first pinch roller to the first capstan; and in which, based upon the actuation of the second actuating lever to actuate the movable means to urge the magnetic head against the magnetic tape, the fourth rotary arm is rotated by the second actuating piece against the fourth spring and then the second rotary arm is rotated through the fourth spring against the second spring to bring the second pinch roller into rotary contact with the second capstan, and the third rotary arm is rotated by the first engaging piece against the third spring through the movable means and then the first rotary arm is rotated by the third spring against the first spring to bring the first pinch roller into rotary contact with the first capstan with the contact pressure lower than that of the second pinch roller to the second capstan.

3,930,270

TAPE GUIDING DRUMS OF THE MAGNETIC RECORDING AND REPRODUCING APPARATUS

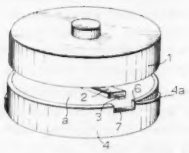
Shizuhiko Tanigawa, Moriguchi; Satoshi Kikuya, Kadoma; Yoshinori Yamazoe, Osaka, and Chihiro Nakamura, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 8, 1974, Ser. No. 486,453

Claims priority, application Japan, July 12, 1973, 48-83014[U]; July 12, 1973, 48-83015[U]

Int. Cl.² G11B *15/60, 5/52, 21/28*

U.S. Cl. 360—130 **5 Claims**



1. A tape guiding drum means for a magnetic recording and reproducing apparatus including;

a lower drum having a cylindrical tape guide surface formed on the upper peripheral portion thereof;

an upper drum having a cylindrical tape guide surface formed on the lower peripheral portion and disposed above the lower drum so as to leave a slit between the drums; and

a rotary magnetic head within the slit, whereby the tape can be run obliquely over the peripheral surface of the drums, straddling the slit;

at least one of the two drums having a notched portion along the edge of the drum which, during operation of the apparatus, is open toward the slit, said notched portion being provided at least at one of the points of the beginning and end of the tape contact with the drum means.

DESIGN PATENTS

GRANTED DECEMBER 30, 1975

ERRATA

For CLASS	See PATENT NO.
026–012	238,314

DESIGNS

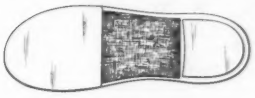
DECEMBER 30, 1975

238,216
SPORT SHOE
William J. Cohen, Boston, Mass., assignor to CITC Industries, New York, N.Y.
Filed Aug 21, 1972, Ser. No. 282,049
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

238,217
EXERCISE SHOE SOLE
Paul L. Cox, 104 Canton Hill Drive, Jackson, Miss. 39211
Filed Mar. 21, 1973, Ser. No. 343,301
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

238,218
BOOT SOLE
Lyle J. Cohn, Lyndhurst, Ohio, assignor to International Seaway Trading Corporation
Filed Dec. 21, 1973, Ser. No. 427,066
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

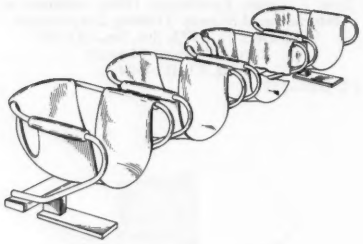
238,219
BOOT SOLE
Lyle J. Cohn, Lyndhurst, Ohio, assignor to International Seaway Trading Corporation
Filed Dec. 21, 1973, Ser. No. 427,067
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319



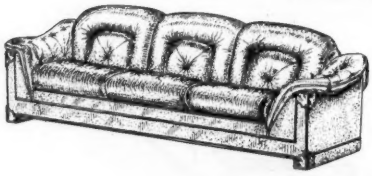
238,220
MOTORCYCLE SEAT
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Sept. 23, 1974, Ser. No. 508,431
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D6—48.1

238,221
MOTORCYCLE SEAT
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.
Filed Sept. 23, 1974, Ser. No. 508,551
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D6—48.1

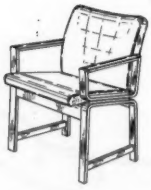
238,222
MULTIPLE SEATING UNIT OR SIMILAR ARTICLE
Gunter F. Eberle, Dallas, Tex., assignor to The Vecta Group, Inc.
Filed June 21, 1973, Ser. No. 372,007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—59



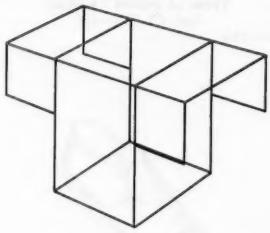
238,223
SOFA OR SIMILAR ARTICLE
Richard I. Brooks, North Hollywood, Calif., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed July 30, 1974, Ser. No. 493,035
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



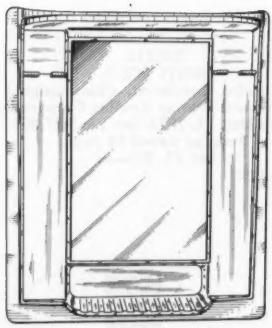
238,224
CHAIR
Frank Reenskaug, Drammen, Norway, assignor to West Norway Factories Ltd. A/S, Orsta, Norway
Filed May 4, 1973, Ser. No. 357,253
Claims priority, application Norway Nov. 17, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



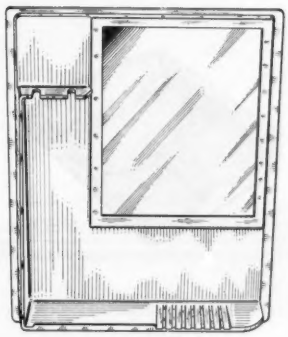
238,225
CLOTHING RACK
Christine R. Lyons, 7634 SE. Monroe, Milwaukie, Oreg. 97222
Filed May 24, 1974, Ser. No. 472,963
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



238,226
SHOWER RACK
William J. Spath, 2902 107th St., Toledo, Ohio 43611, and Harold S. Boutin, Northwood, Ohio; said Boutin assignor to said Spath
Filed Mar. 7, 1975, Ser. No. 556,457
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—91

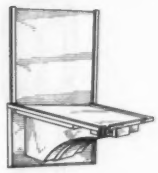


238,227
SHOWER RACK
William J. Spath, 2902 107th St., Toledo, Ohio 43611, and Harold S. Boutin, Northwood, Ohio; said Boutin assignor to said Spath
Filed Mar. 12, 1975, Ser. No. 557,815
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—91

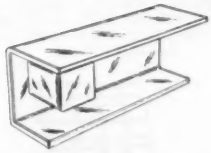


238,228
END STANDARD FOR A GUN RACK
Johnny C. Elkins, 1909½ Pulliam St., and Marvin C. Hanz, 2608 Parkview Drive, both of San Angelo, Tex. 76901
Filed Oct. 7, 1974, Ser. No. 512,376
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114

238,229
PEGBOARD MOUNTED SUPPORT FOR DISPLAYING POWER TOOLS
Terrance Neil Touchett, Batavia, and William E. Kotzenberg, Geneva, Ill., assignors to McGraw-Edison Company, Elgin, Ill.
Filed Jan. 16, 1974, Ser. No. 433,704
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



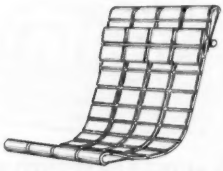
238,230
DESK
William B. Sklaroff, Narberth, Pa., assignor to Tiffany Industries, Inc., St. Louis, Mo.
Filed Mar. 20, 1974, Ser. No. 452,792
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—158



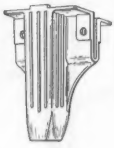
238,231
LEG FOR ARTICLE OF FURNITURE
Myron M. McClain, Dayton, Ohio, assignor to Miami Valley Plastics, Lewisburg, Ohio
Filed Sept. 11, 1974, Ser. No. 505,003
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195

238,232
LEG FOR ARTICLE OF FURNITURE
Myron M. McClain, Dayton, Ohio, assignor to Century Mold, Inc., Tipp City, Ohio
Filed Sept. 11, 1974, Ser. No. 505,004
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195

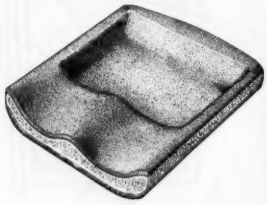
238,233
PILLOWED SLING CHAIR BODY
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Filed Oct. 12, 1973, Ser. No. 405,929
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



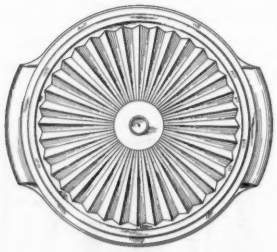
238,234
BED FRAME LEG
Richard A. Miller, Bedford Heights, Ohio, assignor to Rusco Industries, Inc., Los Angeles, Calif.
Filed July 11, 1973, Ser. No. 378,150
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198

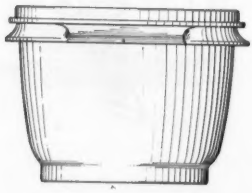


238,235
SEAT CUSHION FOR A WHEELCHAIR
Carl Henrik Elgebrandt, Farsta, Sweden, assignor to Camp Scandinavia AB, Helsingborg, Sweden
Filed Nov. 2, 1973, Ser. No. 412,432
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

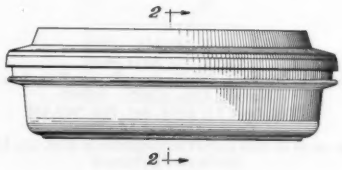


238,236
COMBINED SERVING BOWL AND CLOSURE
Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 16, 1973, Ser. No. 324,006
Term of patent 14 years
The term of this patent subsequent to Aug. 13, 1988, has been disclaimed
Int. Cl. D7—*01*
U.S. Cl. D7—17





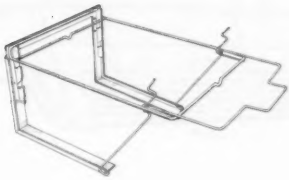
238,237
COMBINED STORAGE BOWL AND SERVING PLATE
Erik Herlow, Tikob, Denmark, and Robert Daenen, Erembodegem, Belgium, assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 18, 1974, Ser. No. 434,738
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



238,238
HANDLE FOR A HOSTESS TRAY OR THE LIKE
Manuel S. Ziskin, Mayfield Heights, and Harold O. Wagner Sheffield Lake, Ohio, assignors to American Trading & Production Corporation, Baltimore, Md.
Filed July 11, 1974, Ser. No. 487,600
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D7—39

238,239
COCKTAIL STIR STICK
Howard E. Barrows and Richard J. Berglund, Racine, Wis., assignors to Tenneco Inc., Racine, Wis.
Filed Dec. 17, 1973, Ser. No. 425,112
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—42

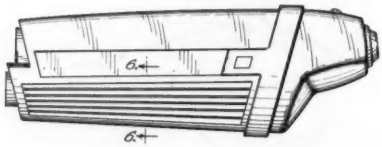
238,240
ROTISSERIE FRAME
Leslie George Dutchburn, 7 Devere Gardens, Toronto 2, Ontario, Canada
Filed Oct. 1, 1974, Ser. No. 511,110
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—129



238,241
HANDLE FOR A CASSEROLE OR THE LIKE
Manuel S. Ziskin, Mayfield Heights, and Harold O. Wagner, Sheffield Lake, Ohio, assignors to American Trading & Production Corporation, Baltimore, Md.
Filed July 11, 1974, Ser. No. 487,599
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D7—132

238,242
CLEANING FLUID APPLICATOR
Gilbert Schwartzman, 20 Wilmot Circle, Scarsdale, N.Y. 10583
Filed Nov. 27, 1973, Ser. No. 419,253
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178

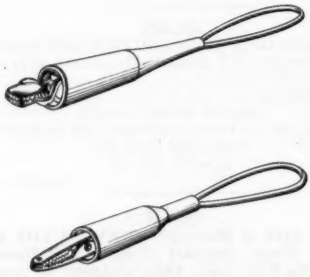
238,243
FLUID POWERED DISPENSING GUN OR SIMILAR ARTICLE FOR VISCOUS MATERIAL
John N. Polivka, San Diego, Calif., assignor to Owatonna Tool Company, Owatonna, Minn.
Filed July 24, 1974, Ser. No. 491,310
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14.1



238,244
BOTTLE OPENER OR SIMILAR ARTICLE
Michael J. Pasquale, 115 Grove St., Middletown, Conn. 06451
Filed May 6, 1974, Ser. No. 467,494
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—18

238,245
SCISSORS
Olof Fredrik Backstrom, Tammisaari, Finland, assignor to Oy Fiskars AB, Helsinki, Finland
Filed Jan. 3, 1974, Ser. No. 430,442
Claims priority, application Finland Nov. 28, 1973
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57

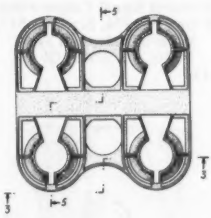
238,246
ARTICLE HOLDER
Robert E. Rickard, 408 Factory St. (or P.O. Box 32), Nevada City, Calif. 95959
Filed June 13, 1973, Ser. No. 369,488
Term of patent 14 years
The term of this patent subsequent to Oct. 10, 1986, has been disclaimed
Int. Cl. D8—*05*
U.S. Cl. D8—71



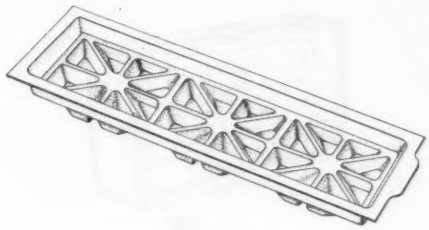
238,247
RETRACTABLE KNIFE
John F. Thomas III, Wyckoff, N.J., assignor to CBS Inc., New York, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,314
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

238,248
BOTTLE OR THE LIKE
James L. Westrich, 814 Parker Ave., Algoma, Wis. 54201
Filed May 24, 1973, Ser. No. 363,759
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

238,249
BOTTLE CARRIER
Gerald Erickson, P.O. Box 6175, Surfside, Fla. 33154
Filed May 22, 1974, Ser. No. 472,089
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—178

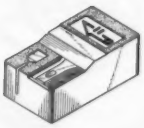


238,250
COMBINED CONFECTIONERY TRAY AND MOLD
William J. Sauer, Jr., Menomonee Falls, Wis., assignor to W. R. Grace & Co., New York, N.Y.
Filed Oct. 30, 1974, Ser. No. 519,327
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187

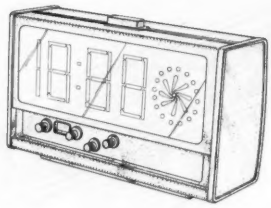


238,251
JEWELRY DISPLAY SUPPORT OR SIMILAR ARTICLE
Iraida Garey, New York, N.Y., assignor to D. Lisner & Co., Inc.
Filed Jan. 2, 1974, Ser. No. 430,225
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—191

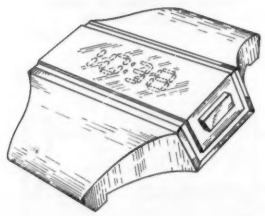
238,252
BLADE DISPENSING PACKAGE
Avram Meshulam, Edison, N.J., assignor to CBS Inc., New York, N.Y.
Filed July 18, 1974, Ser. No. 489,730
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—193



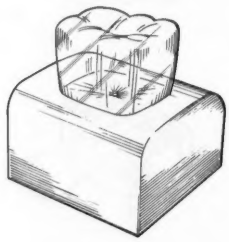
238,253
DIGITAL CLOCK
Tomokazu Suzuki, Tokyo, and Jiro Ochiai, Yokohama, Japan, assignors to Tamura Electric Works, Ltd.
Filed Feb. 25, 1974, Ser. No. 445,102
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



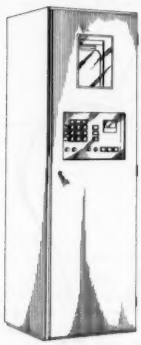
238,254
DIGITAL WRIST WATCH
Eugene Joseph Sulek, Richardson, Tex., assignor to Texas Instruments Incorporated
Filed Aug. 29, 1974, Ser. No. 501,948
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



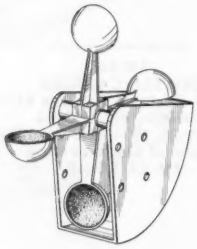
238,255
RUNNING SAND TOOTH TIMER
Edward K. Beckwith, 303 La Marina, Santa Barbara, Calif. 93109
Filed Aug. 2, 1974, Ser. No. 494,195
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—44



238,256
CONSOLE FOR FAULT DETECTOR FOR PAPER WEBS
Pentti Kalervo Mannonen, Kuohukuja 6 D 51, 01600 Myyrmaki, Finland
Filed July 2, 1973, Ser. No. 375,878
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46



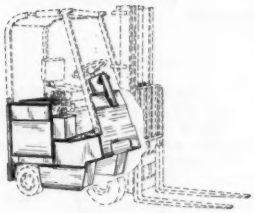
238,257
ROTARY REFLECTOR
Richard Rios, 1429 E. Mission, Escondido, Calif. 92025
Filed Nov. 15, 1974, Ser. No. 524,051
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



238,258
AUDIBLE VEHICLE BACK-UP ALARM
Rudolph M. Duris, Norwalk, Conn., assignor to General Signal Corporation
Filed Oct. 4, 1974, Ser. No. 511,962
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116

238,259
REFUSE TRAILER
Phillip J. Sweet, Buck C. Hamlet, and David L. Sweet, Fresno, Calif., assignors to American Carrier Equipment
Filed July 29, 1974, Ser. No. 492,614
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—15

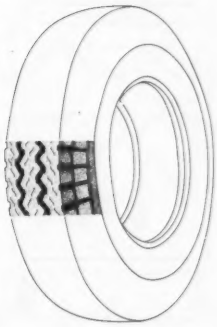
238,260
LIFT TRUCK BODY
Dennis M. Lanci, Battle Creek, Mich., assignor to Clark Equipment Company
Filed Oct. 25, 1973, Ser. No. 409,520
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—61



238,261
SUPPORT LEG FOR A DOCKBOARD
Richard G. Maki, Menomonee Falls, Ronald E. Riemer, Milwaukee, and Roderick B. Potter, Whitefish Bay, Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.
Filed Nov. 5, 1973, Ser. No. 413,171
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60

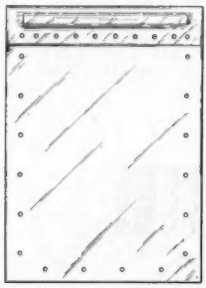
238,262
TIRE
Teruo Ogiso, Gifu, Japan, assignor to Inoue Rubber Co., Ltd., Nagoya-shi, Aichi-ken, Japan
Filed June 13, 1974, Ser. No. 478,902
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

238,263
TIRE
Arthur L. Finley, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 28, 1974, Ser. No. 455,681
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



238,264
TIRE
Teruo Ogiso, Gifu, Japan, assignor to Inoue Rubber Co., Ltd., Nagoya-shi, Aichi-ken, Japan
Filed June 13, 1974, Ser. No. 478,903
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—145

238,265
BOAT HULL COVER
Edward Stewart, 1726 NE. 35th St., Fort Lauderdale, Fla. 33334
Filed Jan. 23, 1975, Ser. No. 543,274
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

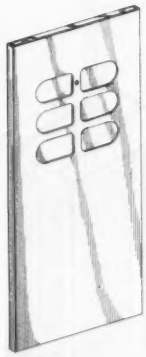


238,266
MOTORCYCLE SADDLE BAG OR SIMILAR ARTICLE
Byrd E. Dalton, 1227 Crescent Drive, Glendale, Calif. 91205
Filed July 17, 1972, Ser. No. 272,166
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

238,267
MOTORCYCLE EXHAUST PIPE
Charles Strada, 2854 N. Cicero Ave., Chicago, Ill. 60641
Filed Aug. 26, 1974, Ser. No. 500,602
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—194

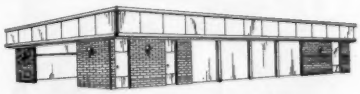
238,268
MOTORCYCLE EXHAUST PIPE
Charles Strada, 2854 N. Cicero Ave., Chicago, Ill. 60641
Filed Aug. 26, 1974, Ser. No. 500,603
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—194

238,269
FRONT DOOR
Yoshiaki Takimoto, B326, 3–7 Nishihara-cho, Tokyo, Japan
Filed Nov. 16, 1972, Ser. No. 307,226
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M

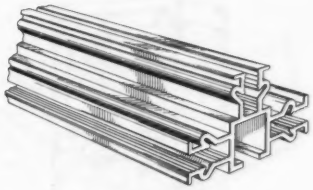


238,270
CAR WASH BUILDING
James W. Baker, 1143 6th St., Santa Monica, Calif. 90403
Filed Oct. 15, 1973, Ser. No. 406,627
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

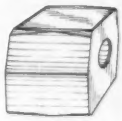
238,271
CAR WASH BUILDING
James W. Baker, 1143 6th St., Santa Monica, Calif. 90403
Filed Oct. 15, 1973, Ser. No. 406,640
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B



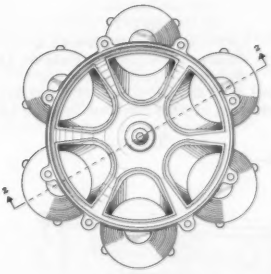
238,272
SUPPORT MEMBER FOR USE WITH SIGNS, SHELVES, PARTITIONS AND THE LIKE
Irving W. Shell, 442 W. Wellington, Chicago, Ill. 60657
Filed Jan. 28, 1974, Ser. No. 437,423
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6

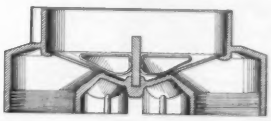


238,273
CASING FOR A FLUID CONDUIT COMPONENT
Jorgen Hogh and Adam Bonne, Copenhagen, Denmark, assignors to A/S Teknova, Niva, Denmark
Filed June 21, 1973, Ser. No. 372,344
Claims priority, application Denmark Dec. 28, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



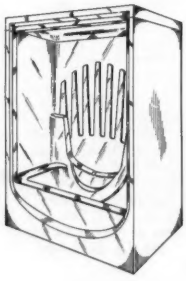
238,274
VALVE BASE
Roger D. Slagel, 1301 SW. 20th Terrace, Fort Lauderdale, Fla. 33312
Filed July 16, 1973, Ser. No. 379,464
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



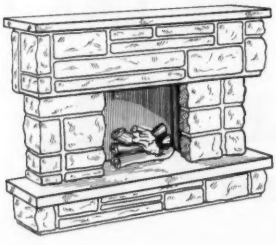


238,275
COMBINED BATHTUB AND SHOWER STALL
Clarence Lee Folden, Downers Grove, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Mar. 13, 1974, Ser. No. 450,664
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

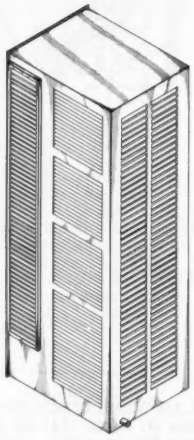
238,276
COMBINED BATHTUB AND SHOWER STALL
Fred C. Alexander, New Castle, Pa., assignor to Universal-Rundle Corp., New Castle, Pa.
Filed July 18, 1974, Ser. No. 489,486
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



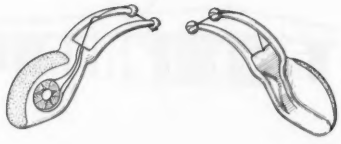
238,277
ARTIFICIAL FIREPLACE
Arthur Zaitlin, 6880 Kildare Cote St. Luc, Montreal, Quebec, Canada
Filed Sept. 24, 1974, Ser. No. 509,027
Claims priority, application Canada May 28, 1974
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



238,278
HOUSING FOR WINDOW AIR CONDITIONER
Walter Baker, Jr., Louisville, Ky., assignor to General Electric Company
Filed July 19, 1974, Ser. No. 490,417
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—144

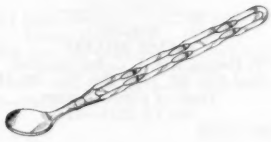


238,279
DENTAL FLOSS HOLDER
Jerome J. French, 1410 Hoffman Ave., Park Ridge, Ill. 60068
Filed Mar. 12, 1975, Ser. No. 557,737
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D

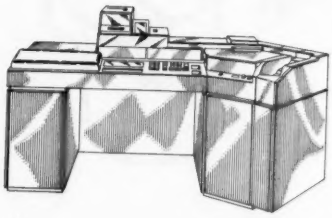


238,280
MOUTH AND DENTAL MIRROR
E. B. Tarrson, Chicago, Ill., assignor to John O. Butler Company, Chicago, Ill.
Filed Nov. 4, 1974, Ser. No. 520,615
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

238,281
DENTAL EXAMINATION MIRROR
John S. Cali, 3452 E. Foothill Blvd., Pasadena, Calif. 91107
Filed Sept. 16, 1974, Ser. No. 506,010
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D



238,282
FINANCIAL PROOF MACHINE OR SIMILAR ARTICLE
Harley J. Shawen and Ralph D. Haney, Waterloo, Ontario, Canada, and Jerry L. Kohli, Ithaca, N.Y., assignors to NCR Corporation
Filed Oct. 9, 1973, Ser. No. 404,519
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

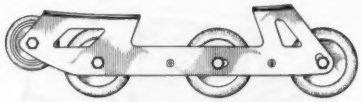


238,283
CALCULATOR
Stephen G. Hauser, Tarzana, Calif., assignor to Addmaster Corporation
Filed Feb. 24, 1975, Ser. No. 552,648
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

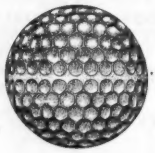
238,284
COMBINED BASKETBALL GOAL AND BRACKET
William C. Toedter, 1034 Nela Parkway, Toledo, Ohio 43615
Filed Sept. 27, 1973, Ser. No. 401,352
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 VV

238,285
GOLF CLUB HEAD
Barney F. Ross, 3302 St. Albans Drive, Los Alamitos, Calif. 90720
Filed June 3, 1974, Ser. No. 475,407
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

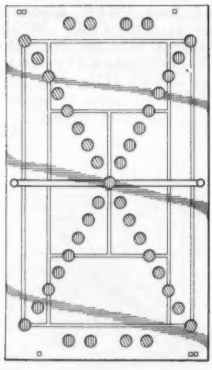
238,286
ROLLER SKATE
Masaomi Ochi, Kobe, Japan, assignor to Ochi Trading Co., Ltd.
Filed Dec. 26, 1973, Ser. No. 428,439
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—14 C



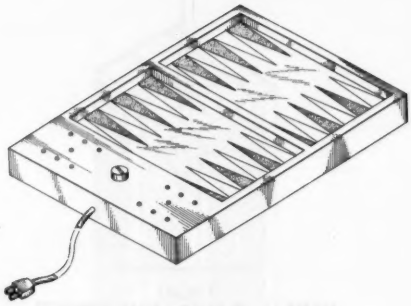
238,287
GOLF BALL
Francis deS. Lynch, Mattapoisett, John W. Jepson, Marion, and Robert A. Brown, Mattapoisett, Mass., assignors to Acushnet Company, New Bedford, Mass.
Filed June 1, 1973, Ser. No. 365,838
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 QQ



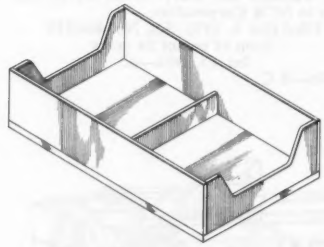
238,288
GAME BOARD
Wilhelmina Schohn, 231 N. Kenilworth Ave., Oak Park, Ill. 60302
Filed Jan. 28, 1974, Ser. No. 437,442
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



238,289
COMBINED ELECTRICALLY LIGHTED DICE AND BACKGAMMON BOARD
Charles P. Regensburg, 875 Park Ave., New York, N.Y. 10017
Filed Feb. 13, 1974, Ser. No. 442,182
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



238,290
GAME BOARD
Justin V. Dobbs, Rte. 5, Columbus, Ind. 46725
Filed Feb. 28, 1974, Ser. No. 446,617
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



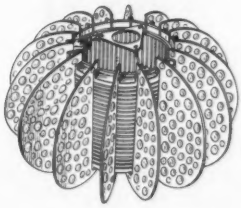
238,291
TOY SPINNING TOP
Peter Balleis, 55 Hermann-Lons-Strasse D–8502, Zirndorf, near Nuremberg, Germany
Filed May 20, 1974, Ser. No. 471,654
Claims priority, application Germany Nov. 28, 1973
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 CC

238,292
NECKLACE
Alfred Joseph Durante, 111—46 76th Drive, Forest Hills, N.Y. 11375
Filed Apr. 24, 1974, Ser. No. 463,752
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 R

238,293
BRACELET
Alfred Joseph Durante, 111—46 76th Drive, Forest Hills, N.Y. 11375
Filed Apr. 24, 1974, Ser. No. 463,594
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 C

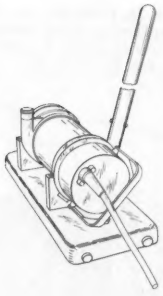
238,294
BRACELET
Alfred Joseph Durante, 111—46 76th Drive, Forest Hills, N.Y. 11375
Filed Apr. 24, 1974, Ser. No. 463,751
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 C

238,295
LAMP SHADE
Kenneth Yuhung Tongson, Kowloon, Hong Kong, assignor to Star Industrial Company, Limited, Kowloon, Hong Kong
Filed Apr. 26, 1974, Ser. No. 464,659
Claims priority, application Great Britain Oct. 29, 1973
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 D

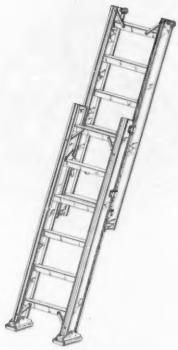


238,296
INDUSTRIAL LIGHT FIXTURE
Camili Trimarchi, 4454 Murdock Ave., Bronx, N.Y. 10466
Filed May 21, 1973, Ser. No. 362,219
Term of patent 3½ years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E

238,297
POOL CLEANER
Ingemar Franzen, Pforzheim, Germany, and Sven Olov Wikholm, Skarholmen, Sweden, assignors to ITT Industries, Inc., New York, N.Y.
Filed Feb. 25, 1974, Ser. No. 445,423
Claims priority, application Sweden Oct. 10, 1973
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—11

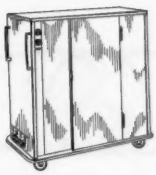


238,298
LADDER
Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling and Stamping Corp., Brooklyn, N.Y.
Filed Aug. 13, 1974, Ser. No. 497,104
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D54—1 A



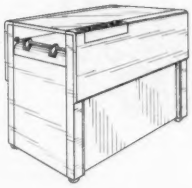
238,299
HEATED CABINET
Richard O. Klemm, Crystal Lake, Ill., assignor to Food Warming Equipment Company, Inc., Elk Grove Village, Ill.
Filed Apr. 8, 1974, Ser. No. 459,088
Term of patent 14 years
Int. Cl. D12—*02*; D15—*08*
U.S. Cl. D55—1 E

238,300
BANQUET CABINET
Richard O. Klemm, Crystal Lake, Ill., assignor to Food Warming Equipment Company, Inc., Elk Grove Village, Ill.
Filed Apr. 8, 1974, Ser. No. 459,089
Term of patent 14 years
Int. Cl. D12—*02;* D15—*08*
U.S. Cl. D55—1 E



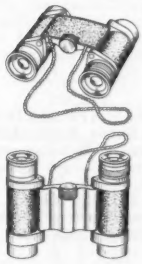
238,301
COMPACTOR
Anthony P. Montalbano, Glencove, N.Y., assignor to Constance Radice, Great Neck, N.Y.
Filed Jan. 21, 1974, Ser. No. 434,846
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 B

238,302
BURSTER OR SIMILAR ARTICLE
Andrew L. Alger, Wilmette, and Kim Yamasaki, Lombard, Ill., assignors to Varco Incorporated, Barrington, Ill.
Filed Sept. 16, 1974, Ser. No. 506,186
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D55—1 A

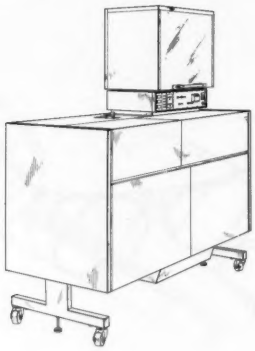


238,303
PAIR OF SPECTACLES
Conrad Leblanc, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Feb. 22, 1974, Ser. No. 445,043
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

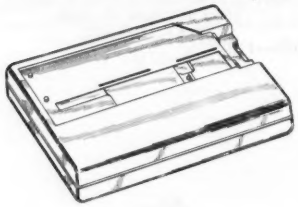
238,304
BINOCULAR
Alfred Hengst, Wetzlar-Dorlar, Heinrich Janke, Braunfels, and Ernst Ruehl, Naunheim, Germany, assignors to Ernst Leitz GmbH
Filed Dec. 9, 1974, Ser. No. 530,655
Claims priority, application Germany June 21, 1974
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



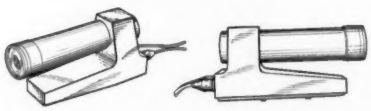
238,305
COMPUTER OUTPUT MICROFILMER
Gene D. Vedder, Granada Hills, Calif., assignor to Stromberg Datagraphix, Inc., San Diego, Calif.
Filed May 23, 1974, Ser. No. 472,575
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



238,306
PORTABLE TRANSACTION LOG RECORDER
Elliot W. J. Spurway, Jr., Concord, Calif., assignor to Dymo Industries, Inc., San Francisco, Calif.
Filed Jan. 23, 1974, Ser. No. 435,997
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 B

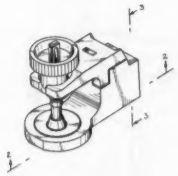


238,307
X-RAY APPARATUS
Vitislav Yakovlevich Bobov, Bolsheokhtinsky prospekt 12, kv. 42; Dmitry Petrovich Rybakov, ulitsa Dzerzhinskogo 69, kv. 22; and Avrum Lvovich Farberg, ulitsa Bolshaya Ozernaya 86, kv. 1, all of Leningrad, U.S.S.R.
Filed July 20, 1973, Ser. No. 380,957
Term of patent 7 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 H



238,308
SPECIMEN COLLECTOR OR SIMILAR ARTICLE
Michael H. Sherin, P.O. Box 124, Fontana, Wis. 53125
Filed Apr. 12, 1974, Ser. No. 460,589
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 V

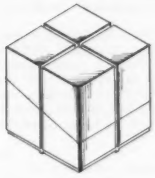
238,309
CIRCUMCISION CLAMP
Carl B. Baumgarten, Houston, Tex., assignor to Gomco Surgical Manufacturing Corp., Buffalo, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,376
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—12 R



238,310
COMBINED COMPACT AND MAKEUP MIRROR
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Jan. 14, 1974, Ser. No. 433,434
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D86—10 N

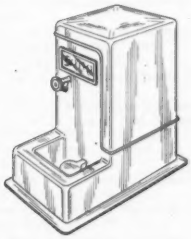
238,311
COMBINED LIPSTICK AND CASING THEREFOR
Ted I. Kingsford and Jayne H. Greene, Memphis, Tenn., assignors to Plough, Inc., Memphis, Tenn.
Filed Mar. 15, 1974, Ser. No. 451,648
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D86—10 G

238,312
JEWELRY BOX OR SIMILAR ARTICLE
Robert S. Witkoff, Glen Cove, Long Island, N.Y., assignor to The Alsten Company
Filed Sept. 3, 1974, Ser. No. 502,504
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 B



238,313
TENT
Robert K. Wright, Belmont, Calif., assignor to Kalmar Trading Co., San Francisco, Calif.
Filed Oct. 9, 1973, Ser. No. 404,277
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D88—3 B

238,314
MULTI-SERVICE MODULE FOR A MOBILE CAMPER PARK
Robert L. Smith, Minnetonka, Minn., assignor to Roart Plastics, Inc., Hopkins, Minn.
Filed Dec. 11, 1974, Ser. No. 531,541
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—12



A. B. Dick Comp
Curtin, Denis
Dick, George
Waldeck, Gu
A. Finkl & Sons
Finkl, Charle
AB Asea-Atom: S
Fredin, Bo; a
AB Bofors: *See—*
Brattsand, Ra
Karl Goran
AB Gustavsbergs
Bjurling, Per
AB Ziristor: *See—*
Palsson, Jan,
Abbate, John; Jev
John. Gasoline
Abdallah, Abdulr
Company, The.
3,930,019, Cl.
Abiko, Shiro; Yo
Masakazu, to M
conversion of
polycyclic arom
Ablad, Bengt Arn
Berntsson, P
Enar Ingem
sson, Benn
Christer; ar
Abraham, Bernard
ica, Energy Res
producing hydr
ACF Industries, I
Guthrie, Larr
Ackermann, Fritz;
G.m.b.H. Pulse
movement of a
ence position. 3
Ackermann, Otto;
Isolation of 1,5-
Acme Air Appliar
Seims, Warre
Acutagawa, Susum
Kumasa, Iku
Acutagawa,
3,929,893.
Addressograph M
Olson, Lorin
Adhesive Material
Shapiro, Alec
Adler, Stanford L.
arator and fibri
Adolf Dassler: *See*
Bente, Alfred
Aeppli, Kurt, to Z
justing correct
cleaners. 3,930,
af Ekenstam, Bo T
Brattsand, Ra
Karl Goran
Agence Nationale
Hadni, Arman
Ullmann, Agn
Aggarwal, Suresh
Popick, Mitch
K., 3,930,20
Aguzzi, Paolo: *See*
Gazzarrini, Fr
3,929,665.
Aiba, Yoshikazu;
Kaoru, to Taki
paring basic alu
Aigami, Koji: *See—*
Nakagawa, Y
3,929,661.
Ainbinder, Emmar
Neustroev, Leon
sorption-type ref
Cl. 62-101.000.
Airco, Inc.: *See—*
Terrell, Ross
Aisin Seiki Kabush
Ishigami, Nori
Ajamie, Amil J., a
Davidson, Ury
Price, James

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Curtin, Denis J., 3,929,478.
Dick, George H.; and Madden, Thomas J., Jr., 3,930,258.
Waldeck, Gunther J., 3,930,082.

A. Finkl & Sons Company: *See—*
Finkl, Charles W., 3,929,423.

AB Asea-Atom: *See—*
Fredin, Bo; and Leine, Lars, 3,929,565.

AB Bofors: *See—*
Brattsand, Ralph Lennart; af Ekenstam, Bo Thuresson; Claeson, Karl Goran; and Thalen, Bror Arne, 3,929,768.

AB Gustavsbergs Fabriker: *See—*
Bjurling, Per Olof; and Juhlin, Sven-Eric, 3,929,367.

AB Ziristor: *See—*
Palsson, Jan, 3,929,045.

Abbate, John; Jewett, Warren R.; and Mason, William H., to Abbate, John. Gasoline tank plug. 3,929,250, Cl. 220-237.000.

Abdallah, Abdulmuniem H.; and Shea, Philip J., to Dow Chemical Company, The. 2-(2-Halophen oxy)acetamidines as antidepressants. 3,930,019, Cl. 424-326.000.

Abiko, Shiro; Yorihiro, Kazuo; Sugihara, Toshiyuki; and Hanawa, Masakazu, to Mitsubishi Petrochemical Co., Ltd. Process for the conversion of hydrocarbon fractions containing condensed-ring polycyclic aromatic hydrocarbon. 3,929,618, Cl. 208-111.000.

Ablad, Bengt Arne Hjalmar: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Abraham, Bernard M.; and Schreiner, Felix, to United States of America, Energy Research and Development Administration. Method of producing hydrogen. 3,929,980, Cl. 423-648.000.

ACF Industries, Incorporated: *See—*
Guthrie, Larry E., 3,929,316.

Ackermann, Fritz; Honig, Gunter; and Schulz, Alfred, to Robert Bosch G.m.b.H. Pulse source to provide a pulse train representative of movement of a shaft and a reference pulse representative of a reference position. 3,930,201, Cl. 328-1.000.

Ackermann, Otto; and Eilingsfeld, Heinz, to BASF Aktiengesellschaft. Isolation of 1,5-dinitroanthraquinone. 3,929,841, Cl. 260-369.000.

Acme Air Appliance Co., Inc.: *See—*
Seims, Warren J.; and Farkas, Gabor, 3,928,902.

Acutagawa, Susumu: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.

Addressograph Multigraph Corporation: *See—*
Olson, Lorin P., 3,929,327.

Adhesive Materials Limited: *See—*
Shapiro, Alec, 3,930,092.

Adler, Stanford L., to Technicon Instruments Corporation. Serum separator and fibrin filter. 3,929,646, Cl. 210-359.000.

Adolf Dassler: *See—*
Bente, Alfred, 3,928,881.

Aeppli, Kurt, to Zellweger, Ltd. Arrangements for automatically adjusting correct reference values for yarn faults in electronic yarn cleaners. 3,930,205, Cl. 330-2.000.

af Ekenstam, Bo Thuresson: *See—*
Brattsand, Ralph Lennart; af Ekenstam, Bo Thuresson; Claeson, Karl Goran; and Thalen, Bror Arne, 3,929,768.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Hadni, Armand; and Thomas, Robert, 3,930,240.
Ullmann, Agnes; and Schwartz, Maxime, 3,930,028.

Aggarwal, Suresh K.: *See—*
Popick, Mitchell A.; Milne, Robert M., III; and Aggarwal, Suresh K., 3,930,209.

Aguzzi, Paolo: *See—*
Gazzarrini, Franco; Aguzzi, Paolo; and Corsini-Mena, Adriana, 3,929,665.

Aiba, Yoshikazu; Furumori, Takaki; Shinpo, Shozo; and Funabiki, Kaoru, to Taki Fertilizer Manufacturing Co., Ltd. Process for preparing basic aluminum salt solution. 3,929,666, Cl. 252-317.000.

Aigami, Koji: *See—*
Nakagawa, Yunosuke; Inamoto, Yoshiaki; and Aigami, Koji, 3,929,661.

Ainbinder, Emmanuil Gershkovich; Kurilov, Georgy Vasilievich; and Neustroev, Leonid Sergeevich. Method of producing cold in an absorption-type refrigerating plant performing this method. 3,928,983, Cl. 62-101.000.

Airco, Inc.: *See—*
Terrell, Ross C.; and Moore, George L., 3,930,013.

Aisin Seiki Kabushiki Kaisha: *See—*
Ishigami, Noriakira Chiryu, 3,930,222.

Ajamie, Amil J., administrator: *See—*
Davidson, Uryon S., deceased; Ajamie, Amil J., administrator; and Price, James B., 3,929,528.

Ajax Hardware Corporation: *See—*
Read, George D., 3,929,386.

Ajinomoto Co., Inc.: *See—*
Inazuka, Shinichi; and Ninagawa, Sadayoshi, 3,92 '19.
Kubota, Koji; Yoshihara, Yasuhiko; and Hi , Yoshio, 3,929,571.
Sano: Konosuke; and Mitsugi, Koji, 3,929,573.

Akahori, Kimihiko; and Era, Masayuki, to Hitachi, Ltd. High speed steel having high wear-resistance. 3,929,471, Cl. 75-123.00J.

Akahori, Kimihiko; and Era, Masayuki, to Hitachi, Ltd. High speed steel having high wear resistance. 3,929,518, Cl. 148-31.000.

Akasaki, Masato; Takashima, Hiroshi; and Shibata, Kazuhiro, to Mitsubishi Chemical Industries, Ltd. Feed for pisciculture. 3,930,018, Cl. 424-322.000.

Akashi, Hiromitsu: *See—*
Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, 3,930,141.

Akeyson, Swan M. Cultivating and particled material applying gardening tool. 3,929,080, Cl. 111-1.000.

AKG Akustische u. Kino-Gerate Gesellschaft m.b.H.: *See—*
Fidi, Werner; and Piribauer, Herbert, 3,930,128.

Akino, Morio: *See—*
Hara, Satoshi; Akino, Morio; and Nakagawa, Keizo, 3,929,298.

Akkerman, Allardus A., to Domtar Limited. Fruit basket. 3,929,274, Cl. 229-52.00B.

Aktiebolaget Atomenergt: *See—*
Johnsson, Erik Borje, 3,929,253.

Aktiebolaget Hassle: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, 3,929,871.

Aktiebolaget IRO: *See—*
Jacobsson, Kurt Arne Gunnar, 3,928,987.

Akzo N.V. of Arnhem, Holland: *See—*
Toth, Anton; Rupp, Hans-Dieter; and Meyer, Gerhard, 3,929,877.

Alberino, Louis M.; and Farrissey, William J., Jr., to Upjohn Company, The. Polycarbodiimides from 4,4'-methylenebis(phenyl isocyanate) and certain carbocyclic monoisocyanates. 3,929,733, Cl. 260-77.50R.

Alberino, Louis M.; Farrissey, William J., Jr.; and Rose, James S., to Upjohn Company, The. Novel compositions and process. 3,930,097, Cl. 428-260.000.

Albers, Edwin Wolf: *See—*
Lussier, Roger J.; Magee, John Storey, Jr.; and Albers, Edwin Wolf, 3,929,621.

Albers-Schonberg, Georg: *See—*
Christensen, Burton G.; Leanza, William J.; and Albers-Schonberg, Georg, 3,929,840.

Albertson, James F. No-overflow toilet. 3,928,874, Cl. 4-1.000.

Albrecht, William L.; and Fleming, Robert W., to Richardson-Merrell Inc. Bis-basic ethers of dibenzofuran. 3,929,802, Cl. 260-293.580.

Albright, Denton M.; and Leach, Charles Willard, to United States Steel Corporation. Pentachlorophenol-creosote wood-preservative. 3,930,025, Cl. 424-346.000.

Alburger, James R. Water-washable inspection penetrant employing triglycerides and polyglycerides of fatty acids. 3,929,664, Cl. 252-301.20P.

Aldridge, David Cecil; Borrow, Antony; and Gerring, Ernest Edward Lawrence, to Imperial Chemical Industries Limited. Pharmaceutical compositions. 3,930,014, Cl. 424-285.000.

Alexander, Albert D. Device for use with X-ray machines. 3,930,164, Cl. 250-468.000.

Alkasab, Kalil A., to Universal Oil Products Company. Solar energy collector. 3,929,122, Cl. 126-271.000.

Allain, Ronald J.: *See—*
Hoffmann, Karl H.; Anderson, Donald R.; and Allain, Ronald J., 3,929,673.

Allard, Pierre, to Societe Rhodiaceta. Solutions of copolymers containing amide and imide groups and process for their preparation. 3,929,691, Cl. 260-30.200.

Allegheny Ludlum Industries, Inc.: *See—*
Gray, Thomas H., 3,929,470.
Salsgiver, James A.; and Malagari, Frank A., 3,929,522.

Allied Chemical Corporation: *See—*
Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., 3,929,738.
Fuhrmann, Robert; Sifniades, Stylianos; and Tunick, Allen Abraham, 3,929,885.
Hamilton, Brian K., 3,928,964.
Lawwill, Ronald C., 3,929,348.

Allied Colloids Limited: *See—*
Griffith, Robert M.; and Parkinson, Christopher, 3,929,629.

Allis-Chalmers Corporation: *See—*
Marsch, James E., 3,929,037.
Allmanna Svenska Elektriska Aktiebolaget: *See—*
Stenkvist, Sven Einar, 3,929,457.
Tjernstrom, Ove, 3,929,010.
Valis, Jaroslav, 3,930,199.
Alsop, Derek J., to Moore Business Forms, Inc. 3'-Amino-6' or 7'-(pyrazol-1-yl)fluoran compounds. 3,929,828, Cl. 260-310.00R.
Alsop, Derek J., to Moore Business Forms, Inc. 9-(4-Aminophenyl polymethine)-9-xanthenol compounds and pressure sensitive system therewith. 3,930,108, Cl. 428-411.000.
Alter, Hobart L., to Coast Catamaran Corporation. Sailboat tiller apparatus. 3,929,086, Cl. 114-144.00R.
Alumax Mill Products, Inc.: *See—*
Malott, Corwin; and Erath, Robert William, 3,929,197.
Aluminum Company of America: *See—*
Anderson, Arvid N.; and Binger, Wayne W., 3,928,999.
King, Larry K.; and Jarrett, Noel, 3,929,975.
Urmston, Hugh C., 3,929,251.
Alza Corporation: *See—*
Higuchi, Takeru, 3,929,132.
Zaffaroni, Alejandro, 3,929,984.
Amado, Juan Jose, Jr. Method of centrifugally casting hollow spheres. 3,929,182, Cl. 164-114.000.
Ambruoso, Pasquale, Sr., to Motorola, Inc. Tuning screw lock and torque control. 3,929,023, Cl. 74-10.850.
Amemiya, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Device for standardizing a maximum value of an out-put signal corresponding to an input analog signal. 3,930,256, Cl. 340-347.00R.
American Can Company: *See—*
La Croce, Leonard Thomas, 3,929,252.
Meyers, George L., 3,929,271.
American Color & Chemical Corporation: *See—*
Botros, Raouf, 3,929,843.
American Cyanamid Company: *See—*
Cross, Barrington; and Walworth, Bryant Leonidas, 3,929,451.
Cross, Barrington; and Grasso, Charles Paul, 3,929,905.
Forgione, Peter Salvatore; and Robbins, Howard M., 3,929,580.
Gershberg, David Benedict, 3,929,751.
Levy, Stephen David; and Rauch, Francis Clyde, 3,929,916.
Lovell, James Byron, 3,929,998.
Rauch, Francis Clyde; Fanelli, Anthony Joseph; and Blank, Gerlinde Metzler, 3,929,917.
Walworth, Bryant Leonidas, 3,930,011.
American Gas Association, Inc.: *See—*
Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., 3,929,615.
American Home Products Corporation: *See—*
Foell, Theodore J., 3,929,759.
Teller, Daniel M.; and Sellstedt, John H., 3,929,781.
American Medical Electronics Corporation: *See—*
Turner, Robert Bruce, 3,929,018.
Ametek, Inc.: *See—*
Hess, Irving J., 3,929,611.
Ameurlaine, Jacques Francois; and Sirieix, Michel Benoit, to Societe Anonyme de Telecommunications. Radiation detector having a mosaic structure. 3,930,161, Cl. 250-370.000.
Amity Leather Products Co.: *See—*
Reis, John P., 3,929,177.
AMP Incorporated: *See—*
Hollyday, Robert David, 3,930,210.
Ampex Corporation: *See—*
Takahashi, Ricardo M., 3,930,171.
Anaconda Company, The: *See—*
Stern, William R.; Jansen, Malcolm L.; and Vance, Bess L., 3,929,598.
Anagnostopoulos, Constantine E.; and Wise, Raleigh W., to Monsanto Company. Method and apparatus for optimizing cure time of elastomeric articles. 3,929,012, Cl. 73-156.000.
Anatronics Corporation: *See—*
Young, Robert R.; Randleman, Patrick L.; and Stolins, Arthur B., 3,929,413.
Anders, Edward Olen: *See—*
Blankenship, Owen Davis; and Anders, Edward Olen, 3,929,083.
Anderson, Amos R.: *See—*
Huerta, James R.; Anderson, Amos R.; and Meyer, Jeffrey G., 3,929,745.
Anderson, Arvid N.; and Binger, Wayne W., to Aluminum Company of America. Process for treatment of coiled aluminum sheet. 3,928,999, Cl. 72-202.000.
Anderson, Donald R.: *See—*
Hoffmann, Karl H.; Anderson, Donald R.; and Allain, Ronald J., 3,929,673.
Anderson, Paul L., to Sandoz, Inc. Chlorophenyl-butadienols. 3,929,906, Cl. 260-618.00D.
Anner, Georg; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. 3-Cyclopentyl ethers of 7α-methyl estrone. 3,929,844, Cl. 260-397.400.
Antos, George J., to Universal Oil Products Company. Method of manufacturing a platinum-tin reforming catalyst. 3,929,683, Cl. 252-466.0PT.
Aoki, Satoshi: *See—*
Takano, Nobuyoshi; Sakai, Kaoru; Aoki, Satoshi; and Yasuda, Kazuo, 3,929,411.
Appleby, Albert E.; and Simpson, Tommy G., to Ethyl Corporation. Deodorizing process. 3,929,637, Cl. 210-63.000.
Aquitaine Total Organico: *See—*
Bernier, Cecile; Jouhaneau, Monique; and Poisson, Pierre, 3,929,734.
Arai, Haruhiko; and Minegishi, Yutaka, to Kao Soap Co., Ltd. Controlled foaming detergent compositions. 3,929,663, Cl. 252-110.000.
Arai, Haruhiko; Tachibana, Kyozaburo; Naganuma, Yoshinori; and Murata, Moriyasu, to Kao Soap Co., Ltd. Liquid detergent composition. 3,929,680, Cl. 252-542.000.
Arai, Tohru: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,930,060.
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, to Nitto Boseki Co., Ltd.; and Japan Atomic Energy Research Institute. Method of molding fiber reinforced plastic flat plates. 3,930,098, Cl. 428-280.000.
Arashi, Norio: *See—*
Tanaka, Hirobumi; Arashi, Norio; Hishinuma, Yukio; and Tamura, Zensuke, 3,929,416.
Arcesi, Joseph A.; and Rauner, Frederick J., to Eastman Kodak Company. Lithographic plates having radiation sensitive elements developable with aqueous alcohol. 3,929,489, Cl. 96-115.00R.
Archambault, Rene F. Device for checking blood pressure. 3,929,129, Cl. 128-2.05C.
ARCO Polymers, Inc.: *See—*
Hulse, George E.; and Kersting, R. James, 3,929,742.
Wright, Harold A., 3,929,690.
Arenhold, Knut. Splash guard. 3,929,352, Cl. 280-154.50R.
Ari, Osami: *See—*
Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,929,775.
Armour Pharmaceutical Company: *See—*
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,929,758.
Armstrong, Jack W., to Lipe Rollway Corporation. Paper sheet conveyor. 3,929,221, Cl. 198-220.0BA.
Armstrong, John H.; and Wassmann, William W., to United States of America, Navy. Local derailment sensor and brake actuator system. 3,929,308, Cl. 246-169.00A.
Arnold, Fred E.: *See—*
Sicree, Albert J.; and Arnold, Fred E., 3,929,832.
Aronson, David, to Compump Systems, Inc. Method and apparatus for pumping a liquid and compressing a gas. 3,929,399, Cl. 417-54.000.
Artos Engineering Company: *See—*
Blaha, Gerald E., 3,929,041.
Artze, Rene G. Stamp vending machine. 3,929,254, Cl. 221-30.000.
Asahi-Dow Limited: *See—*
Izawa, Shinichi; Ozeki, Juro; Tanaka, Tsutomu; and Nakanishi, Atsuo, 3,929,930.
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Komoto, Hiroshi; and Ohmura, Kaoru, 3,929,716.
Kurata, Takeo; Hayazaki, Tamotsu; and Murakami, Kyoko, 3,928,958.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Urano, Fumio, 3,930,263.
Asakura, Osamu: *See—*
Nishikawa, Tatsuo; and Asakura, Osamu, 3,929,067.
Asano, Toshiyasu; and Sumi, Kazuyoshi, to NGK Spark Plug Co., Ltd. High alumina ceramic insulator compositions. 3,929,496, Cl. 106-46.000.
Asano, Yoshio, to Fuji Photo Film Co., Ltd. Film cassette. 3,930,264, Cl. 354-174.000.
Ashton, William B.: *See—*
Mead, Theodore C.; Ashton, William B.; and Shillinglaw, John P., Jr., 3,929,616.
Askew, Herbert Frank: *See—*
Elliott, John Scotchford; Jayne, Gerald John Joseph; and Askew, Herbert Frank, 3,929,653.
Aspes, Pierfrancesco: *See—*
Morero, Domenico; Montiglio, Ugo; Aspes, Pierfrancesco; and Basile, Giampiero, 3,929,978.
Asprey, Larned B.; and Paine, Robert T., Jr., to United States of America, Energy Research and Development Administration. Synthesis of pentafluorides. 3,929,601, Cl. 204-157.10R.
Aspro-Nicholas Limited: *See—*
Wiggins, Leslie Frederick; James, John William; and Gittos, Maurice Ward, 3,930,006.
Atherton, John Heathcote; Plumb, John Beckett; and Stuart, Ronald Sangster, to Imperial Chemical Industries Limited. Process for producing halogenated compounds. 3,929,851, Cl. 260-448.20E.
Atlantic Richfield Company: *See—*
Richardson, Bart D.; and Waggoner, Michael L., 3,928,903.
Russell, Donald Henry; and Lenton, Robert Warren, 3,929,727.
Attwood, Warren R., to Unistrut Corporation. Signpost structure. 3,928,930, Cl. 40-145.00R.
Atwater, Wayne G., to Triax Company, The. Method of assembly for knock-down storage frame. 3,928,905, Cl. 29-446.000.
Atwood Vacuum Machine Company: *See—*
Marx, Thomas O., 3,929,033.
Aurelio, Leonardo Francisco: *See—*
Torres, Hector Jose, 3,928,998.

Austin, Peter William, to Imperial Chemical Industries Limited. New reactive dyestuffs. 3,929,771, Cl. 260-240.00R.

Austral-Erwin Engineering Co.: *See—*
Erwin, Ransome W., 3,929,537.

Avco Corporation: *See—*
Hurd, Gordon, 3,930,247.

AVM Corporation: *See—*
Sheppard, William L., 3,929,249.

Avraham Deshe: *See—*
Solomon, Arieh, 3,929,256.

Ayerst McKenna and Harrison Ltd.: *See—*
Sehgal, Surendra N.; Blazekovic, Teodora M.; and Vezina, Claude, 3,929,992.

B. F. Goodrich Company, The: *See—*
Schollenberger, Charles S.; Dinbergs, Kornelius; and Kelley, Philip C., 3,929,726.
Tucker, Harold; and Minchak, Robert J., 3,929,746.

Babcock & Wilcox Company, The: *See—*
Lecon, Andrew P., 3,929,189.
Tallarovic, James F., 3,929,290.

Bach, Nicholas J.: *See—*
Kornfeld, Edmund C.; and Bach, Nicholas J., 3,929,796.

Bader, Henry; and Jahngen, Edwin G., Jr., to Polaroid Corporation. Crome-complexing azomethine dyes. 3,929,848, Cl. 260-438.50R.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,929,454.
Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, 3,929,898.
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, 3,930,087.

Baessler, Konrad: *See—*
Habig, Kurt; and Baessler, Konrad, 3,929,891.

Bailey, Dunn M.: *See—*
Harper, Ernest A.; and Bailey, Dunn M., 3,929,438.

Bailey, Fay W.: *See—*
Brady, Donnie G.; and Bailey, Fay W., 3,929,708.

Bak, Bruce S.; Deets, Gary L.; and Pokigo, Francis J., to Monsanto Company. Self extinguishing high impact resistant polymeric polyblend. 3,929,722, Cl. 260-42.470.

Baker Drapery Corporation: *See—*
Baker, George H., Sr., 3,928,890.

Baker, George H., Sr., to Baker Drapery Corporation. Drapery supporting linkage. 3,928,890, Cl. 16-87.200.

Baker, Ian Martin; Beynon, John David Emrys; and Roberts, Peter Christopher Tudor, to National Research Development Corporation. Methods of fabricating semiconductor devices. 3,930,065, Cl. 427-89.000.

Bakker, Nicolaas: *See—*
King, John M.; and Bakker, Nicolaas, 3,929,650.

Balavoine, Loic; Cadot, Robert; and Sapy, Jacques, to Crouzet. Prepayment apparatus with a coded ticket. 3,929,278, Cl. 235-61.80R.

Baldino, James P.; and Feltzin, Joseph, to ICI United States Inc. Diesters of tetrabromophthalic anhydride. 3,929,866, Cl. 260-475.00P.

Baldwin Electronics, Inc.: *See—*
Warren, George H.; and Hurtig, Gunnar, III, 3,930,127.

Ball Corporation: *See—*
Diebolt, Edwin J.; and Hendrickson, Roger A., 3,929,165.

Balle, Walter: *See—*
Held, Gerhard; and Balle, Walter, 3,929,540.

Baltimore Aircoil Company, Inc.: *See—*
Engalitcheff, John, Jr., 3,929,435.

Bamberger, Carlos E.; Richardson, Donald M.; and Grimes, Warren R., to United States of America, Energy Research and Development Administration. Process for generating hydrogen. 3,929,979, Cl. 423-648.000.

Banko, Anton, to Surgical Design Corporation. Ultrasonic transducers. 3,930,173, Cl. 310-26.000.

Banks, David Dugmore; and McManus, Francis, to Scapa Engineering Limited. Water extraction method and apparatus. 3,929,061, Cl. 100-116.000.

Barabas, Eugene S., to GAF Corporation. Copolymers of an N-vinyl lactam and an unsaturated lactone. 3,929,735, Cl. 260-78.3UA.

Barabas, Eugene S.; and Grosser, Frederick, to GAF Corporation. Novel flocculent terpolymers. 3,929,739, Cl. 260-78.50B.

Barking Brassware Company Limited: *See—*
Woodward, Alan Francis, 3,929,281.

Barkow, William Henry; and Gross, Josef, to RCA Corporation. Display system with simplified convergence. 3,930,185, Cl. 315-370.000.

Barlow, Charles Brian; and Tomlin, Clive Dudley Spencer, to Imperial Chemical Industries Limited. Pesticidal bis-pyridyl amine derivatives. 3,930,007, Cl. 424-263.000.

Barner, Roland K. Combined bowstring draw and trigger release mechanism for use in archery. 3,929,120, Cl. 124-35.00A.

Barnes, Clarence W.; and Shore, Jack H., to Institutes of Medical Sciences, The. Ectopic beat detector. 3,929,125, Cl. 128-2.06A.

Barnett, Allan E.: *See—*
Sinfelt, John H.; Barnett, Allan E.; and Carter, James L., 3,929,619.

Barth, Jordan B., to Colgate-Palmolive Company. Flavored dentifrice. 3,929,988, Cl. 424-54.000.

Bartl, Herbert: *See—*
Schmidt, Adolf; Bartl, Herbert; and Meckbach, Heinrich, 3,929,706.

BASF Aktiengesellschaft: *See—*
Ackermann, Otto; and Eilingsfeld, Heinz, 3,929,841.

BASF Farben und Fasern A.G.: *See—*
Gehrig, Heinz; Linge, Hermann; and Wagner, Sepp, 3,929,542.

Basile, Giampiero: *See—*
Morero, Domenico; Montiglio, Ugo; Aspes, Pierfrancesco; and Basile, Giampiero, 3,929,978.

Bates, Harry E. High speed optical wavelength detection system. 3,929,398, Cl. 356-186.000.

Baugher, William Lewis, to Procter & Gamble Company, The. Process for preparing a meat flavoring. 3,930,046, Cl. 426-533.000.

Bautis, Arthur N., to R. P. Cargille Laboratories, Inc. Immersion oil formulations for use in microscopy and similar fields. 3,929,667, Cl. 252-408.000.

Baxter Laboratories, Inc.: *See—*
Leonard, Ronald J., 3,929,414.
Pekkarinen, Michael O., 3,929,128.

Bayer Aktiengesellschaft: *See—*
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 3,929,863.
Buchel, Karl-Heinz, 3,929,820.
Darsow, Gerhard; Bottenbruch, Ludwig; and Schnell, Hermann, 3,929,901.
Krock, Friedrich Wilhelm; and Neeff, Rutger, 3,929,401.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,929,798.
Rosendahl, Friedrich-Karl; Pelousek, Herbert; and Niederprum, Hans, 3,929,720.
Schmidt, Adolf; Bartl, Herbert; and Meckbach, Heinrich, 3,929,706.
Siegle, Peter; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,929,838.

Bayer, George S.: *See—*
Midland, Richard W.; Bayer, George S.; and Kreiger, Keith H., 3,930,118.

Bayliss, William Richards Gilbert: *See—*
Weaver, John; Maynard, David Payne; Taylor, Rayner Walter; and Bayliss, William Richards Gilbert, 3,929,377.

Beadles, Glenn H., Jr. Changeable game caller with two distinct sound systems. 3,928,935, Cl. 46-180.000.

Beale, Julian Robert Anthony: *See—*
Nicholas, Keith Harlow; Ford, Ronald Alfred; and Beale, Julian Robert Anthony, 3,929,512.

Beane, Theodore E.; and Kirsch, Alan L., to United States of America, Navy. Guided missile fuze system. 3,929,075, Cl. 102-70.20P.

Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 5 (6)-Benzene ring substituted benzimidazole-2-carbamate derivatives. 3,929,821, Cl. 260-309.200.

Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 1,5(6)-Disubstituted benzizimidazole-2-carbamate derivatives having anthelmintic activity. 3,929,822, Cl. 260-309.200.

Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 3,929,823, Cl. 260-309.200.

Beard, Colin C.; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 5(6)-Benzene ring substituted benzimidazole-2-carbamate derivatives having anthelmintic activity. 3,929,824, Cl. 260-309.200.

Beauchet, Jean, to Societe Nouvelle de Roulements. Cutting wheels for the isostatic cutting of pieces, notably from tubes. 3,929,044, Cl. 82-46.00A.

Beck, Hans-Joachim: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,929,714.

Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, to Troponwerke Dinklage & Co. Coumarine derivatives and process for the preparation thereof. 3,930,003, Cl. 424-248.000.

Becker, Kenneth F.; and Pedersen, Nicholas F., to Sperry Rand Corporation. Power transmission. 3,928,968, Cl. 60-403.000.

Becker, Otto Alfred. Thermally insulating wall units. 3,929,186, Cl. 165-49.000.

Beckmann, Ruediger: *See—*
Kummer, Horst; and Beckmann, Ruediger, 3,930,017.

Becton, Dickinson and Company: *See—*
Pecorella, Saviour S., 3,929,021.

Bedenbender, John W.; and Kelly, Gilbert H., to Texas Instruments, Corporation. Servo hydraulic transducer and method of operation. 3,929,206, Cl. 181-114.000.

Beeding, Jack D., to Mask, E. Dale; and Mattox, Ernest M., a part interest to each. Exercise device. 3,929,331, Cl. 272-79.00D.

Beermann, Claus; Knittel, Volker; and Dursch, Walter, to Hoechst Aktiengesellschaft. Aminohydroxypolycarboxylic acid compounds. 3,929,874, Cl. 260-534.00M.

Behar, Marcel N., to Eaton Corporation. Drive transfer gear assembly for four-wheel drive vehicle. 3,929,200, Cl. 180-49.000.

Behrenz, Wolfgang: *See—*
Siegle, Peter; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,929,838.

Beiersdorf Aktiengesellschaft: *See—*
Muller, Heinz; and Szonn, Bodo, 3,930,102.

Bell Telephone Laboratories, Incorporated: *See—*
Ermanis, Felix; and Schwartz, Bertram, 3,929,589.
Ryan, Francis William; Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,930,066.

Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, to Telecommunications Radioelectriques et Telephoniques T.R.T. Time multiplexed digital filter. 3,930,147, Cl. 235-156.000.

Beltran, Adrian M.: *See*—
Schilling, William F.; and Beltran, Adrian M., 3,928,901.

Belttary, Harold E., to Caribe Circuit Breaker Co., Inc. Circuit breaker. 3,930,211, Cl. 335-6.000.

Belyaev, Albert Mikhailovich: *See*—
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Ben Venue Laboratories, Inc.: *See*—
Taborsky, Robert G., 3,929,879.

Benerito, Ruth R.: *See*—
Ward, Truman L.; and Benerito, Ruth R., 3,929,535.

Benndahl, Lars Olov. Conveyor systems. 3,929,077, Cl. 104-93.000.

Benoit-Guyod, Jean-Louis Alain: *See*—
Benoit-Guyod, Martine Pierrette; Benoit-Guyod, Jean-Louis Alain; Boucherle, Andre Louis; and Eymard, Pierre Luc, 3,929,869.

Benoit-Guyod, Martine Pierrette; Benoit-Guyod, Jean-Louis Alain; Boucherle, Andre Louis; and Eymard, Pierre Luc, to Labaz. Pentanol derivatives. 3,929,869, Cl. 260-482.00C.

Benson, Gleudon M., to New Process Industries, Inc. Thermal oscillator. 3,928,974, Cl. 60-650.000.

Bente, Alfred, to Adolf Dassler. Method and mould for the manufacture of a plastic sole for shoes. 3,928,881, Cl. 12-142.00R.

Benz, Mark G., to General Electric Company. Flexible cobalt-rare earth permanent magnet product and method for making said product. 3,929,519, Cl. 148-31.570.

Berg, Gerhard; and Nordsiek, Karl-Heinz, to Chemische Werke Huels Aktiengesellschaft. Process for the production of pourable, pulverulent rubber-filler mixtures. 3,929,707, Cl. 260-29.70T.

Bergt, Gregory P., to Wendt Laboratories, Inc. Stable suspension of calcium-magnesium oxytetracycline for intrauterine administration in treatment of bovine metritis. 3,929,980, Cl. 424-227.000.

Beringer, Monique; and Buchmann, Paul, to Tamag Basel AG. Process for the manufacture of regenerated tobacco. 3,929,141, Cl. 131-17.00R.

Bernholz, William F., to PVO International Inc. Fog resistant polymer compositions. 3,929,699, Cl. 260-23.0XA.

Bernier, Cecile; Jouhaneau, Monique; and Poisson, Pierre, to Aquitaine Total Organico. Fire-resistant polyamide from brominated aromatic dicarboxylic acid diaryl ester. 3,929,734, Cl. 260-78.00R.

Bernstein, Jack: *See*—
Wojnar, Robert John; Brittain, Russell James; Bernstein, Jack; and Losee, Kathryn Alice, 3,930,005.

Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, to Aktiebolaget Hassle. Pharmaceutical preparations containing amines useful for treatment of cardiovascular diseases. 3,930,016, Cl. 424-300.000.

Berthold, Cornelius E.: *See*—
Miyoshi, T. Kenneth; Berthold, Cornelius E.; Stephens, Frank M., Jr.; and Schellinger, Alfred K., 3,929,461.

Beske, Grant A., to Du Pont de Nemours, E. I., and Company. Magnetic recording compositions and elements of low abrasiveness and process for making them. 3,929,658, Cl. 252-62.540.

Besnard, Francois: *See*—
Lutz, Jean; Traille, Andre; and Besnard, Francois, 3,929,009.

Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., to Minnesota Mining and Manufacturing Company. Tape applicating apparatus. 3,929,552, Cl. 156-391.000.

Betz Laboratories, Inc.: *See*—
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,561.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,562.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,563.
Swered, Paul; and Girard, Mary Anne, 3,930,015.

Beyer, Elmo M., Jr.; and Quebedeaux, Bruno, Jr., to Du Pont de Nemours, E. I., and Company. Selected amidoxy compounds as flower preservatives. 3,929,447, Cl. 71-68.000.

Beyer, Horst; and Veutgen, Hans-Jurgen, to Goetzewerke. Method for producing alloys having wear-resistant surfaces. 3,929,181, Cl. 164-58.000.

Beynon, John David Emrys: *See*—
Baker, Ian Martin; Beynon, John David Emrys; and Roberts, Peter Christopher Tudor, 3,930,065.

Beynon, John O., to Preston Metal and Roofing Products Limited. Structural member with end connector. 3,928,950, Cl. 52-726.000.

Bhatia, Kamlesh K.: *See*—
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,929,915.

Bhattacharya, Nishit: *See*—
Zumfeld, Heinz; Rutten, Hermann; and Bhattacharya, Nishit, 3,929,297.

Biber, Conrad H.; and Shenk, Edwin K., to Polaroid Corporation. Electronic flash coupling system for sequential flashbulb firing circuit. 3,930,184, Cl. 315-241.00P.

Biberbach, Peter; Dietschmann, Werner; and Lubke, Hans-Joachim, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Electrolytic burnished gold bath with higher rate of deposition. 3,929,595, Cl. 204-44.000.

Bickel, Bruce T. Insulation device for protection against heat. 3,929,167, Cl. 138-151.000.

Bickel, Hans; and Mueller, Johannes, to Ciba-Geigy Corporation. Aminopyridinium acetyl cephalosporanes. 3,929,779, Cl. 260-243.00C.

Bicker, Wilhelm: *See*—
Frenyo, Pal; Bicker, Wilhelm; and Hellmuth, Werner, 3,929,378.

Bille, Heinz: *See*—
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, 3,930,087.

Billiton Research B. V.: *See*—
Peters, Franciscus J. W. M.; Middelhoek, Servaas; and Rijkeboer, Albert, 3,929,460.

Bindrum, Irmgard: *See*—
Brandt, Wilhelm; and Bindrum, Irmgard, 3,930,109.

Binger, Wayne W.: *See*—
Anderson, Arvid N.; and Binger, Wayne W., 3,928,999.

Biomarine Industries, Inc.: *See*—
Parker, Frederick A.; and Mac Bride, William R., 3,929,588.

Biroczky, Steve I.: *See*—
Fyans Frank; and Biroczky, Steve I., 3,929,301.

Bjurling, Per Olof; and Juhlin, Sven-Eric, to AB Gustavsbergs Fabriker. Means for locking a gripping member of a pair of gripping tongs against rotation. 3,929,367, Cl. 294-99.00R.

Blaha, Gerald E., to Artos Engineering Company. Wire aligning device for use with a wire stripping machine. 3,929,041, Cl. 81-9.510.

Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, to Bayer Aktiengesellschaft. Aromatic diamino carbonic acid esters. 3,929,863, Cl. 260-471.00R.

Blair, Clarence I., to Blair-Lefler, Inc. Air deflecting vane assembly for a vehicle. 3,929,369, Cl. 296-1.00S.

Blair-Lefler, Inc.: *See*—
Blair, Clarence I., 3,929,369.

Blank, Gerlinde Metzler: *See*—
Rauch, Francis Clyde; Fanelli, Anthony Joseph; and Blank, Gerlinde Metzler, 3,929,917.

Blankenship, Owen Davis; and Anders, Edward Olen, to Global Marine Inc. Apparatus for clearing a path through ice. 3,929,083, Cl. 114-40.000.

Blazekovic, Teodora M.: *See*—
Sehgal, Surendra N.; Blazekovic, Teodora M.; and Vezina, Claude, 3,929,992.

Bleicher, Manfred: *See*—
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.

Blejwas, Walter T., Jr.; and Dickinson, Peter D., to Vydec, Inc. Synchronizing system for refresh memory. 3,930,250, Cl. 340-324.00A.

Blocker, William C. Tool for installation of seals for LP gas cylinder valves. 3,929,042, Cl. 81-121.00R.

Blood, Alden E.: *See*—
Snapp, Thomas C., Jr.; and Blood, Alden E., 3,929,846.
Snapp, Thomas C., Jr.; and Blood, Alden E., 3,929,847.

Bloom, Harvey J.: *See*—
Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 3,930,231.

Blount, David H. Production of silico-dihydrogen sulfate. 3,929,972, Cl. 423-325.000.

Blust, Henry Leo; Lindburg, Norman Lee; and Henry, Dale Vernon, to RCA Corporation. Method of anchoring metallic coated leads to ceramic bodies and lead-ceramic bodies formed thereby. 3,929,426, Cl. 29-195.000.

Bochard, Camille, to Robatel S.L.P.I. Package for transporting or enclosing radioactive materials. 3,930,166, Cl. 250-506.000.

Boden, Knut Folke Ingemar: *See*—
Knipstrom, Karl-Erik; Uhlig, Heinz Oskar; and Boden, Knut Folke Ingemar, 3,930,138.

Bodor, Nicolae S.: *See*—
Higuchi, Takeru; Bodor, Nicolae S.; and Shek, Efraim, 3,929,813.

Boehringer Mannheim G.m.b.H.: *See*—
da Fonseca-Wollheim, Friedrich, 3,929,581.
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, 3,929,763.
Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, 3,929,764.
Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, 3,929,793.

Boelkins, Wallace G., to Uni-Mist, Inc. Spool valve for multiple adjustable systems. 3,929,161, Cl. 137-625.690.

Bogacz, Frank J., to GTE Automatic Electric Laboratories Incorporated. Input/output controller maintenance arrangement for a communication switching system. 3,930,146, Cl. 235-153.0AK.

Boggs, Luther Miles; and Flichman, Howard John, to Western Electric Company, Inc. Measuring article thickness ultrasonically. 3,929,006, Cl. 73-67.80S.

Bohemia Inc.: *See*—
Trocino, Frank S., 3,929,446.

Bolling, Robert W.; and Reeves, Jerry H., to Union Camp Corporation. Bags with film liners and method of making. 3,929,275, Cl. 229-55.000.

Boltze, Karl-Heinz: *See*—
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,930,003.

Boonstra, Lieuwe: *See*—
Salters, Roelof Herman Willem; Boonstra, Lieuwe; and Lambrechtse, Cornelis Willem, 3,930,239.

Borden, Inc.: *See*—
Columbus, Peter Spiros, 3,929,694.

Borg-Warner Corp
Donaldson, D
Kelbel, Donal
Borror, Alan L.; a
tographic proce
as optical filter
Borror, Alan L., to
a phenolate gro
Borrow, Antony: S
Aldridge, Dav
ward Lawre
Borup, Herbert H.
ogenic tank. 3,9
Boschetti, Eugene
Compositions a
tyl)-2 indane di
Bossert, Friedrich:
Meyer, Horst;
3,929,798.
Boszor, Samuel M
strengthened spe
Botros, Raouf, to A
ythiophenoxyant
Bottenbruch, Ludw
Darsow, Gerh
3,929,901.
Bouchara, D. Emi
preparation and
Boucher, Raymond
or gas phase ster
hyde and a fl
252-106.000.
Boucherle, Andre
Benoit-Guyod,
Alain; Bouc
3,929,869.
Bouillon, Claude; I
ciete Anonyme d
dioxaluminin and
Bourassa, Joseph R
Lopez, Manuel
Bourgeois, Louis: S
Degueldre, Lo
geois, Louis,
Bowles, Renile E., t
gated member. 3
Bowser, George H.
Mazzoni, Rena
3,928,953.
Boyce, Finis O.: Se
Metz, Ferdinar
3,930,030.
Boyer, Walter J., t
mounted grass ca
Brady, Donnie G.; a
Arylene sulfide p
260-29.1SB.
Brandeis University
Leeman, Susan
Brandl, Hermann J
ting and/or groov
larly cardboard m
Brandstrom, Arne E
Berntsson, Ped
Enar Ingema
sson, Benny
Christer; and
Brandt, Wilhelm; a
schaft. Process fo
macromolecular
Brantley, Richard E
3,929,448, Cl. 71
Brattsand, Ralph Le
Goran; and Thale
their manufacture
260-239.55D.
Braytenbah, Andrew
trical system for e
Cl. 60-660.000.
Braytenbah, Andrew
Westinghouse El
trip system for a t
Braytenbah, Andrew
tric Corporation.
turbine power pla
Brennan, Earl D., to
conversion of amm
Cl. 423-520.000.
Breslow, Jeffrey D.,
paratus with obsta
Bretthauer, Klaus; a
ite printing plate.
Bretting, Jork, to L
wave tube havin
315-3.500.

Borg-Warner Corporation: *See—*
Donaldson, Desmond M.; and Millard, Gregory S. T., 3,929,643.
Kelbel, Donald W., 3,929,029.
Borror, Alan L.; and Garcia, Paulina P., to Polaroid Corporation. Photographic processes and products employing 8-quinolinol phthaleins as optical filter agents. 3,929,797, Cl. 260-287.0CE.
Borror, Alan L., to Polaroid Corporation. pH sensitive dyes containing a phenolate group. 3,929,829, Cl. 260-326.150.
Borrow, Antony: *See—*
Aldridge, David Cecil; Borrow, Antony; and Gerring, Ernest Edward Lawrence, 3,930,014.
Borup, Herbert H., to Kaiser Aluminum & Chemical Corporation. Cryogenic tank. 3,929,247, Cl. 220-9.0LG.
Boschetti, Eugene, to Lipha Lyonnaise Industrielle Pharmaceutique. Compositions and methods of killing rodents using (diphenyl acetyl)-2 indane dione-1,3. 3,929,983, Cl. 424-17.000.
Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,929,798.
Boszor, Samuel M., to Union Carbide Corporation. Carbon fiber strengthened speaker cone. 3,930,130, Cl. 179-181.00R.
Botros, Raouf, to American Color & Chemical Corporation. Dihydroxythiophenoxyanthraquinones. 3,929,843, Cl. 260-383.000.
Bottenbruch, Ludwig: *See—*
Darsow, Gerhard; Bottenbruch, Ludwig; and Schnell, Hermann, 3,929,901.
Bouchara, D. Emile. Phenylpiperazine derivatives, process for their preparation and applications thereof. 3,929,792, Cl. 260-268.0PH.
Boucher, Raymond Marcel Gut, to Wave Energy Systems Inc. Liquid or gas phase sterilizing and cleaning composition containing an aldehyde and a fluoro or perfluoro compound. 3,929,662, Cl. 252-106.000.
Boucherle, Andre Louis: *See—*
Benoit-Guyod, Martine Pierrette; Benoit-Guyod, Jean-Louis Alain; Boucherle, Andre Louis; and Eymard, Pierre Luc, 3,929,869.
Bouillon, Claude; DuFaure, Pierre; and Rosenbaum, Georges, to Societe Anonyme dite: L'Oreal. Antiperspirant composition containing dioxaluminin and dioxaluminane. 3,929,986, Cl. 424-46.000.
Bourassa, Joseph R.: *See—*
Lopez, Manuel; and Bourassa, Joseph R., 3,928,887.
Bourgeois, Louis: *See—*
Degueldre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,929,608.
Bowles, Renile E., to Hoerner Waldorf Corporation. Reinforced corrugated member. 3,929,272, Cl. 229-23.00C.
Bowser, George H.: *See—*
Mazzoni, Renato J.; Bowser, George H.; and Stewart, John L., 3,928,953.
Boyce, Finis O.: *See—*
Metz, Ferdinand E.; Boyce, Finis O.; and Segmiller, James L., 3,930,030.
Boyer, Walter J., to Perfection Manufacturing Company, The. Rear mounted grass catcher. 3,928,956, Cl. 56-202.000.
Brady, Donnie G.; and Bailey, Fay W., to Phillips Petroleum Company. Arylene sulfide polymers comprising silicone fluids. 3,929,708, Cl. 260-29.1SB.
Brandeis University: *See—*
Leeman, Susan E.; and Carraway, Robert E., 3,929,756.
Brandl, Hermann Josef, to Coulter Electronics, Inc. Longitudinal cutting and/or grooving machine for material webs in motion, particularly cardboard means. 3,929,047, Cl. 83-499.000.
Brandstrom, Arne Elof: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.
Brandt, Wilhelm; and Bindrum, Irmgard, to Hoechst Aktiengesellschaft. Process for the manufacture of metallized shaped bodies of macromolecular material. 3,930,109, Cl. 428-422.000.
Brantley, Richard K. Method for enhancing the life of cut flowers. 3,929,448, Cl. 71-68.000.
Brattsand, Ralph Lennart; af Ekenstam, Bo Thuresson; Claeson, Karl Goran; and Thalen, Bror Arne, to AB Bofors. Steroids, processes for their manufacture and preparations containing same. 3,929,768, Cl. 260-239.55D.
Braytenbah, Andrew S., to Westinghouse Electric Corporation. Electrical system for electrohydraulic emergency trip system. 3,928,975, Cl. 60-660.000.
Braytenbah, Andrew S.; Jaegtnes, Karl O.; and Smith, Millard F., to Westinghouse Electric Corporation. Electrohydraulic emergency trip system for a turbine power plant. 3,928,976, Cl. 60-660.000.
Braytenbah, Andrew S.; and Jaegtnes, Karl O., to Westinghouse Electric Corporation. Electrohydraulic on-line testable trip system for turbine power plant. 3,928,977, Cl. 60-660.000.
Brennan, Earl D., to Koppers Company, Inc. Method for the thermal conversion of ammonium sulfate to ammonium bisulfate. 3,929,977, Cl. 423-520.000.
Breslow, Jeffrey D., to Marvin Glass & Associates. Surface pulling apparatus with obstacle signaling. 3,929,336, Cl. 273-108.000.
Bretthauer, Klaus; and Simon, Erich, to Swiss Aluminum Ltd. Composite printing plate. 3,929,073, Cl. 101-395.000.
Bretting, Jork, to Licentia Patent-Verwaltungs-G.m.b.H. Traveling-wave tube having improved electron collector. 3,930,182, Cl. 315-3.500.
Breuer, Hermann, to E. R. Squibb & Sons, Inc. Acylthiomethyl esters of cephalosporins. 3,929,774, Cl. 260-243.00C.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. [(Acylcarbamoyl) thioacetyl] cephalosporin derivatives. 3,929,778, Cl. 260-243.00C.
Breuer, Hermann, to E. R. Squibb & Sons, Inc. 1,2,4-Oxadiazolonylacetyl cephalosporins. 3,929,782, Cl. 260-243.00C.
Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 3,929,776.
Brewster, Phillip William; Hamblin, Peter Collen; and Rutherford, James Pennycook, to Exxon Research & Engineering Co. Ortho alkyl phenol and ortho alkyl phenol sulphide lubricating oil additives. 3,929,654, Cl. 252-48.200.
Brichima S.p.A.: *See—*
Maggioni, Paolo, 3,929,913.
Bridgestone Tire Company Limited: *See—*
Katagiri, Yoshiaki; Urayama, Takao; and Mori, Masaji, 3,929,546.
Nishimura, Seiichiro, 3,929,043.
Brink, Robert H., Jr.: *See—*
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,561.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,562.
Shema, Bernard F.; and Brink, Robert H., Jr., 3,929,563.
Brinkmann, Dieter; Simon, Wolfgang; and Zimon, Heinrich, to Kraftwerke Union Aktiengesellschaft. Heat exchanger installation for a closed gas circulatory system, such as a thermal power plant, for example. 3,929,188, Cl. 165-66.000.
Bristol Products, Inc.: *See—*
Cohn, Lawrence P.; Crawford, Dennis W.; and Turner, Larry G., 3,929,317.
British Petroleum Company Limited, The: *See—*
Davies, Evan Ellis; and Pout, Christopher Ronald, 3,929,624.
British Secretary of State for Defence: *See—*
Watton, Rex, 3,930,157.
Britschinn, Horst; Federer, Fritz; and Neumann, Henning, to Metzeler Kautschuk AG. Inflatable tube bodies. 3,928,879, Cl. 9-400.000.
Brittain, Russell James: *See—*
Wojnar, Robert John; Brittain, Russell James; Bernstein, Jack; and Losee, Kathryn Alice, 3,930,005.
Bro, Per; Kelsey, Robert H.; and Marincic, Nikola, to P. R. Mallory & Co., Inc. Multi cell reserve battery. 3,929,507, Cl. 136-114.000.
Broemer, Heinz; and Meinert, Norbert, to Ernst Leitz G.m.b.H. Optical borate glass of high chemical resistance and process of making same. 3,929,495, Cl. 106-47.00Q.
Brown, Dwight Collin; and Brown, Kevin Bruce. Sandals and method for making same. 3,928,927, Cl. 36-11.500.
Brown, Earle S., to Union Carbide Corporation. Trivalent metal salts of dodecametal triaconta carbonyls. 3,929,969, Cl. 423-263.000.
Brown, Kevin Bruce: *See—*
Brown, Dwight Collin; and Brown, Kevin Bruce, 3,928,927.
Browning, Vernon D.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,929,957.
Brunner, August H., Jr.: *See—*
Moynahan, Edward B.; Brunner, August H., Jr.; and Skreckoski, Gerald R., 3,929,466.
Brunson, Lawrence A.: *See—*
Rostron, Joseph R.; Brunson, Lawrence A.; and Soles, Otto H., 3,930,134.
Brusadin, Giacomo; and Prosdocimo, Giordano, to Uniflex S.p.A. Water line. 3,929,288, Cl. 239-201.000.
Brushenko, Anatoli: *See—*
Szymber, Oleg; and Brushenko, Anatoli, 3,929,099.
Buchel, Karl-Heinz, to Bayer Aktiengesellschaft. Process for the production of N-tritylimidazoles. 3,929,820, Cl. 260-309.000.
Buchmann, Paul: *See—*
Beringer, Monique; and Buchmann, Paul, 3,929,141.
Buchner, Norbert; Liede, Dieter; Schmeer, Peter; and Vogele, Gunther, to Robert Bosch Verpackungsmaschinen G.m.b.H. Apparatus for the sterilization of packaging material. 3,929,409, Cl. 21-91.000.
Buckbee-Mears Company: *See—*
Frantzen, John J., 3,929,551.
Budden, Brian Thomas, to Samuel Jones & Company, Limited. Stencils. 3,929,068, Cl. 101-128.200.
Bugaut, Andree: *See—*
Kalopissais, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,403.
Kalopissais, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,404.
Bugelski, William G.; and Teasley, Robert E., Jr., to Cummins Engine Company, Inc. Filtering and mixing apparatus. 3,929,645, Cl. 210-251.000.
Buonomo, Franco; Fattore, Vittorio; Zanoni, Gianfranco; and Notari, Bruno, to Snam Progetti S.p.A. Catalytic compositions useful for the oxidation of carbon monoxide and hydrocarbons and the process for preparing them. 3,929,681, Cl. 252-465.000.
Burdeska, Kurt: *See—*
Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, 3,929,719.
Burdis, Roy Stonier, to Screentex Limited. Method of packaging tubular stencils. 3,929,227, Cl. 206-446.000.
Burdyn, Ralph F.: *See—*
Chang, Harry L.; Cook, Evin L.; and Burdyn, Ralph F., 3,929,190.
Burens, James H.; and Wallace, Kenneth A., to North Electric Company. Switching transistor drive apparatus. 3,930,170, Cl. 307-254.000.
Buret, Jean Pierre: *See—*
Hirsch, Jean; and Buret, Jean Pierre, 3,929,994.

Buriks, Rudolf S.; and Fauke, Allen R., to Petrolite Corporation. Use of polymeric quaternary ammonium betaines as oil-in-water demulsifiers. 3,929,632, Cl. 210-43.000.

Buriks, Rudolf S.; and Fauke, Allen R., to Petrolite Corporation. Use of polymeric quaternary ammonium betaines as water clarifiers. 3,929,635, Cl. 210-54.000.

Burke, Noel I.; Dowell, Arthur M., Jr.; Talty, Robert D.; and Kremer, Kenneth J., to Tee-Pak, Inc. Edible collagen sausage casing and process for preparing same. 3,930,035, Cl. 426-140.000.

Burke, Noel I., to Tee-Pak, Inc. Edible collagen sausage casing and method of preparing same. 3,930,036, Cl. 426-140.000.

Burke, Willie C. Vehicle litter compactor. 3,929,060, Cl. 100-100.000.

Burkett, Wilford B.; and Orsino, Joseph A., to McCulloch Corporation. Formation of battery plates. 3,929,505, Cl. 136-34.000.

Burleson, Cuba L.; and Dillon, Charles B. Trailer apparatus. 3,929,353, Cl. 280-423.00R.

Burmah Oil Trading Limited: *See—*
Nowell, Roger; and Tate, Philip Edward Russell, 3,929,715.

Burrell, William E., to W. R. Grace & Co. Method for evacuating packages. 3,928,938, Cl. 53-22.00B.

Burroughs Corporation: *See—*
Ferguson, Alisdair Cullen; McGregor, John; and MacPherson, Alastair George, 3,930,236.

Bury, George John; and Swick, Edwin Grant, to Illinois Tool Works Inc. Adhesive mounting device. 3,928,894, Cl. 24-73.0VA.

Burzen, Norman J., to Nordon Industries, Inc. Control means for adjusting the vend price of a coin handling mechanism. 3,929,212, Cl. 194-1.00L.

Busch, Juergen Peter, to NSM Apparatebau GmbH Kommanditgesellschaft. Gaming apparatus. 3,929,338, Cl. 273-138.000.

Butler, David V.: *See—*
Lee, Henry L.; Orlowski, Jan A.; and Butler, David V., 3,929,001.

Butler Manufacturing Company: *See—*
Solimar, Keith F., 3,929,261.

Butova, Margarita Nikolaevna: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Rossomakho, Yakov Vulfovich; and Butova, Margarita Nikolaevna, 3,930,139.

Button, Harold O.; and Trimble, Robert A., to Mobil Oil Corporation. Production of lubricating oils blending stocks. 3,929,626, Cl. 208-309.000.

Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Rossomakho, Yakov Vulfovich; and Butova, Margarita Nikolaevna. Nonconsumable electrode for oxygen arc working. 3,930,139, Cl. 219-145.000.

Byrne, John A.; and Rhea, Charles K., Jr., to Universal Identification Systems, Inc. Animal food monitor. 3,929,277, Cl. 235-61.60R.

Byron Jackson Inc.: *See—*
Howard, James A.; and Kelly, Robert R., 3,929,235.

Cadart, Michel: *See—*
Leroy, Pierre; Debras, Maurice; Cadart, Michel; and Saleil, Jean, 3,929,458.

Cadot, Robert: *See—*
Balavoine, Loic; Cadot, Robert; and Sapy, Jacques, 3,929,278.

Cala, Francis R., to Colgate-Palmolive Company. Particulate silicate-hydroxyalkyl iminodiacetate built detergent compositions of improved properties. 3,929,679, Cl. 252-527.000.

Calderazzo, Fausto: *See—*
Dell'Amico, Daniela Belli; and Calderazzo, Fausto, 3,929,973.

Caldwell, Donald L.: *See—*
Spears, Johnnie E.; and Caldwell, Donald L., 3,929,541.

Caldwell, Edward N., to Robertshaw Controls Company. Differential pressure operated pilot relay and system and diverting relay construction utilizing the same or the like. 3,929,160, Cl. 137-625.500.

Caldwell, John R.: *See—*
Dombroski, John R.; and Caldwell, John R., 3,929,868.

Callahan, James L., to Standard Oil Company, The. Manufacture of dinitriles from thiodinitriles. 3,929,859, Cl. 260-465.80R.

Cambridge Thermionic Corporation: *See—*
Simpson, Paul A., 3,929,390.

Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., to Johnson & Johnson. Non-slip waistband product. 3,930,090, Cl. 428-196.000.

Campbell, Scott V., to Scott, Francis A. Electrical alarm system. 3,930,246, Cl. 340-214.000.

Canadian Industries Limited: *See—*
Findlay, Donald Urquhart; McGaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,959.
Findlay, Donald Urquhart; McCaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,960.

Canadian Patents and Development Limited: *See—*
Sharpe, Anthony N.; and Michaud, Gregory L., 3,929,583.
Thayer, William; Pageau, Lucien; and Sourirajan, Srinivasa, 3,929,945.
Visman, Jan; and Hamza, Hassan A., 3,929,633.

Cann, Everett Douglas, to Cann, Everett Douglas; and Neiman, William T. High temperature flue gas treatment. 3,929,967, Cl. 423-242.000.

Canon Kabushiki Kaisha: *See—*
Nishikawa, Tatsuo; and Asakura, Osamu, 3,929,067.

Cape Air Conditioning (Proprietary) Ltd.: *See—*
Kloot, Leslie John, 3,929,280.

Carfi, Edward M. Hair vacuum with stripping clasp. 3,929,142, Cl. 132-9.000.

Caribe Circuit Breaker Co., Inc.: *See—*
Belttary, Harold E., 3,930,211.

Carl, Klaus: *See—*
Schmidt, Rolf; Carl, Klaus; Gustin, Pol Ambroise Ghislain Joseph; and Schayes, Raymond Georges, 3,930,119.

Carlsson, Enar Ingemar: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, to Aktiebolaget Hassle. 1-(3-Hydroxy-4-alkyl-phenyl)-alkylamines(-2) and the salts thereof. 3,929,871, Cl. 260-501.170.

Carlsson, Stig Ake Ingemar: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Carosella, Michael C.: *See—*
Todd, Lamar S.; Fitzgibbon, Alan; Carosella, Michael C.; and Hilty, Donald C., 3,929,464.

Carraway, Robert E.: *See—*
Leeman, Susan E.; and Carraway, Robert E., 3,929,756.

Carriveau, Ronald S. Show and tell apparatus. 3,928,926, Cl. 35-76.000.

Carroll, Gordon S., to International Telephone and Telegraph Corporation. Sound communication system. 3,930,123, Cl. 179-1.00R.

Carter, James L.: *See—*
Sinfelt, John H.; Barnett, Allan E.; and Carter, James L., 3,929,619.

Cascio, Giuseppe: *See—*
Manghisi, Elso; and Cascio, Giuseppe, 3,930,008.

Case, Cecil L., to Hesston Corporation. Double windrowing method and apparatus. 3,928,955, Cl. 56-1.000.

Case, Derek Frank. Manufacture of magnetic heads. 3,928,908, Cl. 29-603.000.

Casey, James H.: *See—*
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., 3,929,552.

Cashin, Colin H.; Chakrabarti, Jiban K.; and Szinai, Stephen S., to Lilly Industries, Ltd. 2-Phenyl-adamantanealkylamine compounds and their salts. 3,929,888, Cl. 260-570.5CA.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, 3,929,740.

Castagna, Eugene G., to Dart Industries Inc. High impact compositions of polyethylene and polypropylene block copolymers. 3,929,932, Cl. 260-876.00B.

Caterpillar Tractor Co.: *See—*
Hackett, David E.; and Keske, Frank E., 3,929,394.

Caveney, Robert John, to De Beers Industrial Diamond Division Limited. Diamond particle having a composite coating of titanium and a metal layer. 3,929,432, Cl. 51-295.000.

Celanese Corporation: *See—*
Levers, William E.; and Keith, Charles H., 3,930,077.
Taskier, Henry T., 3,929,509.

Cement and Concrete Association, The: *See—*
Weaver, John; Maynard, David Payne; Taylor, Rayner Walter; and Bayliss, William Richards Gilbert, 3,929,377.

Centre de Recherches Metallurgiques— Centrum voor Research in de Metallurgie: *See—*
Hamilius, Albert, 3,929,638.
Marquet, Freddy Antoine, 3,930,159.

Cerasoli, Anthony. Parallel walking bar assembly. 3,929,330, Cl. 272-63.000.

Cerefice, Steven A.; and Fields, Ellis K., to Standard Oil Company, The. Dicyclohexadiene tetraacyl compounds. 3,929,711, Cl. 260-31.80B.

Chakrabarti, Jiban K.: *See—*
Cashin, Colin H.; Chakrabarti, Jiban K.; and Szinai, Stephen S., 3,929,888.

Challender, Ronald Scott: *See—*
Dent, Kenneth Henry; and Challender, Ronald Scott, 3,929,007.

Chamberlain, Noel Christopher. Leak-off pipe for fuel injection equipment. 3,929,109, Cl. 123-32.00R.

Champion International Corporation: *See—*
Cohn, Robert, 3,929,035.
Vincent, David N., 3,930,101.

Chang, Harry L.; Cook, Evin L.; and Burdyn, Ralph F., to Mobil Oil Corporation. Secondary oil recovery by waterflooding with extracted petroleum acids. 3,929,190, Cl. 166-274.000.

Chang, Leroy L.; Esaki, Leo; and Ludeke, Rudolf, to United States of America, Army. Molecular beam epitaxy of alternating metal-semiconductor films. 3,929,527, Cl. 148-175.000.

Chapman, Charles C., to Phillips Petroleum Company. Fractionation of effluent from HF catalyzed alkylation. 3,929,924, Cl. 260-683.420.

Chapman, Charles; C., to Phillips Petroleum Company. Recovery of a propane-ethane product and recycle of propane in HF alkylation. 3,929,925, Cl. 260-683.480.

Chapman, Francis E.; and Grant, Robert F., to S. C. Johnson & Son, inc. Surface treating compositions. 3,929,492, Cl. 106-3.000.

Chapman, Harvey A., to Minnesota Mining and Manufacturing Company. Dual cross-flow canister and process. 3,929,419, Cl. 23-288.0FB.

Chappell, Robert
Manfred H., to
grance mater
252-522.000.

Chattopadhayay,
GmbH & Co. K
compressive m
123-139.00R.

Chaux, Jean-Bern
Ravet, Georg

Chemische Werk
Berg, Gerhar

Chemische Werk
Streck, Rolar

Chernenko, Niko
Filatov, Niko
nenko, Ni
Mashlenko
ieev, Artur
chenko, Vl
nev, Vitaly
3,929,524.

Chernenko, Serg
Zlotin, Boris
and Chern

Cheskis, Harvey
Corporation. P
148-11.50R.

Chevron Researc
King, John M
Suzuki, Shige

Chicago Musical
Moore, Doug

Chicago Rawhide
Peisker, Glen

Chicklis, Evan P.;
ates, Inc. Infrar

Child, James L.,
Schmunk, Jo
Wise, John

Childs, Richard L
Tosti, Umber

Chimura, Kazuya
and Shimoshin
cess for prepar

Chimura, Kazuya
shima, Masao;
chi, to Mitsul
3,930,103, Cl.

Chinuki, Takashi
Suda, Hideak
Hosaka, Hi
Yanagihara

Chirgwin, Keith M
chine. 3,930,17

Chisholm, John.
metal surfaces.

Chisholm, Lloyd

Chiyoda Chemica
Terashima, C

Chottiner, Jacob
Sampson, Ro

Christen, Gilbert;
Thuillier, Rene
Cl. 428-398.00

Christensen, Burt
Georg, to Mer
propyl)phospho

Chu, Simon Long
Novel lithograp

Chung, Daniel A.
ureaurethane s

Cialone, David R.
nack, Richard
International B
tem for ink jet

Ciba-Geigy AG:
Garner, Robe
Ramanathan,
Stagi, Mauro,

Ciba-Geigy Corp
Anner, Georg
Bickel, Hans;
Cook, Barry,
Drabek, Joze
Durr, Dieter;
Fitzi, Konrad
Kaufmann, H
Kristinsson, H
McCrae, Jam
Pugin, Andre
Rathgeb, Pau
Schmid, Wolf

Cimarusti, Christo
Hauck, Frede
Joseph E.,

Chappell, Robert L.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Bicyclic fragrance materials and processes therefor. 3,929,676, Cl. 252-522.000.

Chattopadhayay, Asoke; and Schmidt, Karl, to Deutsche Vergaser GmbH & Co. Kommanditgesellschaft. Fuel injector arrangement for compressive mixture internal combustion engines. 3,929,114, Cl. 123-139.00R.

Chaux, Jean-Bernard: *See—*
Ravet, Georges; and Chaux, Jean-Bernard, 3,929,408.

Chemische Werke Huels Aktiengesellschaft: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,929,707.

Chemische Werke Huls Aktiengesellschaft: *See—*
Streck, Roland; and Weber, Heinrich, 3,929,850.

Chernenko, Nikolai Fedorovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Chernenko, Sergei Vladimirovich: *See—*
Zlotin, Boris Nikolaevich; Timofeev, Valentin Vyacheslavovich; and Chernenko, Sergei Vladimirovich, 3,929,008.

Cheskis, Harvey P.; Shapiro, Stanley; and Pryor, Michael J., to Olin Corporation. Process for producing Cu-base alloys. 3,929,516, Cl. 148-11.50R.

Chevron Research Company: *See—*
King, John M.; and Bakker, Nicolaas, 3,929,650.
Suzuki, Shigeto, 3,929,896.

Chicago Musical Instrument Co.: *See—*
Moore, Douglas R., 3,929,051.

Chicago Rawhide Manufacturing Company: *See—*
Peisker, Glenn W., 3,929,340.

Chicklis, Evan P.; and Kuppenheimer, John D., Jr., to Sanders Associates, Inc. Infrared photography. 3,930,158, Cl. 250-330.000.

Child, James L., Jr.: *See—*
Schmunk, John D.; Child, James L., Jr.; Shroy, Robert E.; and Wise, John, 3,929,359.

Childs, Richard L.: *See—*
Tosti, Umberto V.; and Childs, Richard L., 3,929,171.

Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, to Mitsubishi Rayon Co., Ltd. Process for preparing linear polyesters. 3,929,728, Cl. 260-75.00R.

Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, to Mitsubishi Rayon Co., Ltd. Light transmitting fibers. 3,930,103, Cl. 428-361.000.

Chinuki, Takashi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.

Chirgwin, Keith M., to Garrett Corporation, The. Dynamoelectric machine. 3,930,175, Cl. 310-160.000.

Chisholm, John. Method of making thermal attachment to porous metal surfaces. 3,928,907, Cl. 29-527.400.

Chisholm, Lloyd Duncan. Rotary engine. 3,929,105, Cl. 123-8.090.

Chiyoda Chemical Engineering and Construction Co., Ltd.: *See—*
Terashima, Osamu; and Okabayashi, Ikuo, 3,928,979.

Chottiner, Jacob: *See—*
Sampson, Ronald N.; and Chottiner, Jacob, 3,930,094.

Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, to Rhone-Poulenc, S.A. Hollow fibres. 3,930,105, Cl. 428-398.000.

Christensen, Burton G.; Leanza, William J.; and Albers-Schonberg, Georg, to Merck & Co., Inc. Labile esters of (−)(cis-1,2-epoxypropyl)phosphonic. 3,929,840, Cl. 260-348.00A.

Chu, Simon Long; and Shimazu, Ken-Ichi, to Polychrome Corporation. Novel lithographic plate and method. 3,929,591, Cl. 204-17.000.

Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Polyureaurethane shock absorbing unit. 3,929,729, Cl. 260-75.0NH.

Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., to International Business Machines Corporation. Ink recirculating system for ink jet printing apparatus. 3,929,071, Cl. 101-335.000.

Ciba-Geigy AG: *See—*
Garner, Robert; and Petitpierre, Jean Claude, 3,929,831.
Ramanathan, Visvanathan, 3,929,785.
Stagi, Mauro, 3,929,826.

Ciba-Geigy Corporation: *See—*
Anner, Georg; and Kalvoda, Jaroslav, 3,929,844.
Bickel, Hans; and Mueller, Johannes, 3,929,779.
Cook, Barry, 3,929,804.
Drabek, Jozef, 3,929,817.
Durr, Dieter; and Pissiotas, Georg, 3,929,883.
Fitzi, Konrad, 3,929,807.
Kaufmann, Heinz; and Wettstein, Albert, 3,929,769.
Kristinsson, Haukur; and Rufenacht, Kurt, 3,929,809.
McCrae, James McGeachie, 3,929,794.
Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, 3,929,719.
Rathgeb, Paul; Vogel, Christian; and Weiss, Anton G., 3,929,816.
Schmid, Wolfgang; Gutzwiller, Ernst; and Meyer, Urs, 3,929,806.

Cimarusti, Christopher M.: *See—*
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., 3,930,022.

Cincinnati Electronics Corporation: *See—*
Pandey, Raghvendra K., 3,929,556.

Ciulacu, Paraschiv I.: *See—*
Constantin, Gurgui N.; Luca, Vasile; Eckardt, Andras; and Ciulacu, Paraschiv I., 3,930,088.

Claeson, Karl Goran: *See—*
Brattsand, Ralph Lennart; af Ekenstam, Bo Thuresson; Claeson, Karl Goran; and Thalen, Bror Arne, 3,929,768.

Clark Equipment Company: *See—*
Shealy, Noah A., 3,929,036.

Clark, K. Warren, to E. R. Squibb & Sons, Inc. Chewing gum having enhanced flavor. 3,930,026, Cl. 426-3.000.

Clark, Kenneth G.: *See—*
Ohr, Jack; and Clark, Kenneth G., 3,929,521.

Clark-Monks, Colin, to Fiberglas Canada Ltd. Crystallizable glass suitable for fiber production. 3,929,497, Cl. 106-50.000.

Clark, William E., to Federal-Mogul Corporation. Method of making polytetrafluoroethylene sealing elements with hydrodynamic action. 3,929,341, Cl. 277-134.000.

Clemens, Jon Kaufmann; and Palmer, Richard Claxton, to RCA Corporation. Video capacitive disc playback apparatus and stylus with dielectric coating therefor. 3,930,117, Cl. 178-6.60R.

Clendinning, Robert A.; Potts, James E.; and Gorham, William F., to Union Carbide Corporation. Biodegradable shaped articles from a material comprising a particulate addition polymer in a matrix of a thermoplastic oxyalkanoyl polymer. 3,929,937, Cl. 260-896.000.

Clerbois, Lucien: *See—*
Degueldre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,929,608.

Cline, David J., to Dynafoil, Inc. Height control system for a hydrofoil watercraft. 3,929,084, Cl. 114-66.50H.

Cloud, Larry L.: *See—*
Kelly, Vincent J.; Cloud, Larry L.; and Smalligan, Wayne J., 3,930,027.

Clow Corporation: *See—*
Diebel, Leverne G., 3,929,538.

Coast Catamaran Corporation: *See—*
Alter, Hobart L., 3,929,086.

Coates Brothers & Company Limited: *See—*
Hudson, Alan George; and Orpwood, John Leonard, 3,929,698.

Coaton, James Richard, to Thorn Electrical Industries Limited. Electrical incandescent filament devices. 3,930,178, Cl. 313-275.000.

Cochrane, Robin Adam, to Girling Limited. Master cylinder assemblies for hydraulic systems. 3,929,162, Cl. 137-627.500.

Coggins, Leroy, to Cornell Research Foundation, Inc. Method and composition for the diagnosis of equine infectous anemia virus infection by using agar-gel-immunodiffusion reaction. 3,929,982, Cl. 424-12.000.

Cohen, Hyman; Vago, Paul; and Skender, Davorin. Electrodynamic loudspeaker with basket mounting to pole piece. 3,930,129, Cl. 179-115.50R.

Cohn, Lawrence P.; Crawford, Dennis W.; and Turner, Larry G., to Bristol Products, Inc. Valve assembly. 3,929,317, Cl. 251-223.000.

Cohn, Robert, to Champion International Corporation. Electric control safety mechanism. 3,929,035, Cl. 74-616.000.

Coleman, Arthur, to Raymond Lee Organization, Inc., The, a part interest. Coiffure hood. 3,929,143, Cl. 132-36.10R.

Colgate-Palmolive Company: *See—*
Barth, Jordan B., 3,929,988.
Cala, Francis R., 3,929,679.
Colodney, Daniel; and Cordon, Martin, 3,929,987.
Karami, Hamzeh, 3,929,134.

Collins, Michael Clive: *See—*
Wookey, Norman; Jackson, Arthur Frederick; Collins, Michael Clive; and Francis, Brian, 3,930,048.

Colodney, Daniel; and Cordon, Martin, to Colgate-Palmolive Company. Toothpaste. 3,929,987, Cl. 424-52.000.

Columbus, Peter Spiros, to Borden, Inc. Clear adhesive applicator crayon comprising agar and polyacrylamide. 3,929,694, Cl. 260-17.4ST.

Colvert, James H.: *See—*
Nelson, Gerald V.; Youngblood, Douglas J.; and Colvert, James H., 3,929,668.

Combustion Engineering, Inc.: *See—*
Noyes, Richard Croissant, 3,929,566.

Commercial Solvents Corporation: *See—*
Jurisch, Louis A., 3,929,748.
Miescher, Guido M., 3,929,575.

Commonwealth Scientific & Industrial Research Organization: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,929,502.

Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
Montagne, Jean Bernard, 3,929,539.

Compugraphic Corporation: *See—*
Salava, Roger F.; Eastman, Brian G.; and King, George W., 3,930,251.

Compump Systems, Inc.: *See—*
Aronson, David, 3,929,399.

Computervision Corporation, The: *See—*
Villers, Philippe, 3,930,237.

Comstedt, Tore Erik Karl, to Teknoflex Control System AB. Single lever control device. 3,929,039, Cl. 74-878.000.

Consolidated Foods Corporation: *See—*
Gaudry, Paul Emile, 3,929,437.

Consortium fur Elecktrochemische Industrie GmbH: *See—*
Thyret, Helmut Eugen, 3,929,799.

Constantin, Gurgui N.; Luca, Vasile; Eckardt, Andras; and Ciulacu, Paraschiv I., to Intreprinderea "Bucuresti" Pentru Extragerea, Prelucrarea si Moatarea Marmurei si Pietrei de Constructii. Decorative material. 3,930,088, Cl. 428-143.000.

Continental Oil Company: *See—*
Johnson, Morris A.; and Yang, Kang, 3,929,599.
Sutko, Adolph A.; and Myers, George M., 3,929,388.

Cook, Barry, to Ciba-Geigy Corporation. 4-Piperidine acetamide compounds. 3,929,804, Cl. 260-293.630.

Cook, Evin L.: *See—*
Chang, Harry L.; Cook, Evin L.; and Burdyn, Ralph F., 3,929,190.

Cook, Henry S., to Southwire Company; and National Steel Corporation. Anode carrier lifting device. 3,929,231, Cl. 212-11.000.

Cook Paint and Varnish Company: *See—*
Wright, Howard J.; and Harwell, Kenneth E., 3,929,744.

Cooke, Claude Everett, Jr.: *See—*
Graham, John Wayne; Muecke, Thomas Wayne; and Cooke, Claude Everett, Jr., 3,929,191.

Coone, Malcolm G., to Lynes, Inc. Vapor recovery fuel nozzle apparatus. 3,929,175, Cl. 141-392.000.

Cooper, Terence Alfred; and Logothetis, Anestis Leonidas, to Du Pont de Nemours, E. I., and Company. Process for recovering boron trifluoride. 3,929,749, Cl. 260-86.700.

Cooper, Terence Alfred; and Khan, Ausat Ali, to Du Pont de Nemours, E. I., and Company. Preparation of sol chloroprene polymers. 3,929,752, Cl. 260-92.300.

Cor Tech Research Limited: *See—*
Vasishth, Ramesh C., 3,930,089.

Corbin, Dean L. Livestock unloading and treating trailer assembly. 3,929,104, Cl. 119-82.000.

Cordon, Martin: *See—*
Colodney, Daniel; and Cordon, Martin, 3,929,987.

Corliss, Glenn Arthur; and Furgal, Henry Paul, to Miles Laboratories, Inc. Simulated bacon product and process therefor. 3,930,033, Cl. 426-103.000.

Corll, James A.: *See—*
Nasby, Robert D.; and Corll, James A., 3,929,345.

Cornell Research Foundation, Inc.: *See—*
Coggins, Leroy, 3,929,982.

Cornils, Boy: *See—*
Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, 3,929,900.

Corrodi, Hans Rudolf: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, 3,929,871.

Corsaut, Jay C. Surgical suction irrigator. 3,929,126, Cl. 128-240.000.

Corsini-Mena, Adriana: *See—*
Gazzarrini, Franco; Aguzzi, Paolo; and Corsini-Mena, Adriana, 3,929,665.

Cosden Oil & Chemical Company: *See—*
Stevenson, John L., 3,929,686.

Cottam, Stephen M.; Day, Howard E.; and Griffith, William A., to Hecla Mining Company. Production of lead and silver from their sulfides. 3,929,597, Cl. 204-66.000.

Coulter Electronics, Inc.: *See—*
Brandl, Hermann Josef, 3,929,047.

Cox, Ernest P. Waste wood reduction machine. 3,929,294, Cl. 241-101.700.

CPC International Inc.: *See—*
Morrill, Elliott; and Miller, James E., 3,929,697.

Cragoe, Edward J., Jr.; Schultz, Everett M.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Indanacetic acid compounds. 3,929,872, Cl. 260-515.00R.

Cramer, Jerry W.: *See—*
Paddock, Paul F.; and Cramer, Jerry W., 3,928,942.

Crane, Hewitt David; and Savoie, Robert Ellis, to Stanford Research Institute. Handwriting system. 3,930,229, Cl. 340-146.3SY.

Crawford, Dennis W.: *See—*
Cohn, Lawrence P.; Crawford, Dennis W.; and Turner, Larry G., 3,929,317.

Creger, Paul L., to Parke, Davis & Company. Pharmaceutical compositions and methods. 3,930,024, Cl. 424-343.000.

Creger, Paul L.: *See—*
Moersch, George W.; and Creger, Paul L., 3,929,897.

Creusot-Loire: *See—*
Leroy, Pierre; Debras, Maurice; Cadart, Michel; and Saleil, Jean, 3,929,458.

Cronenberger, Michel; Laurent, Serge; and Mallet, Maurice, to Rhone-Poulenc, S.A. Coating process using a fluidisable powder comprising a heat-stable bisimide resin and particles of glass or mica. 3,930,070, Cl. 427-185.000.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. Pre-emergence 1,2-dialkyl-3,5-disubstituted herbicidal compounds and method for using same. 3,929,451, Cl. 71-92.000

Cross, Barrington; and Grasso, Charles Paul, to American Cyanamid Company. Chloromethyl 1,1-dimethyl-2-propynyl ether and process. 3,929,905, Cl. 260-614.00R.

Crouch, William B., to Texaco Inc. Fuel gas from solid carbonaceous fuels. 3,929,429, Cl. 48-201.000.

Crouzet: *See—*
Balavoine, Loic; Cadot, Robert; and Sapy, Jacques, 3,929,278.

Crutchfield, Marvin M.: *See—*
Rapko, John N.; and Crutchfield, Marvin M., 3,929,875.

Csordas, Elemer; Gaugenmaier, Karl; and Kotitschke, Gerhard, to J. M. Voith GmbH. Wedge press for continuous dehydration of a web of fibrous material, such as fiberboard, especially. 3,929,065, Cl. 100-90.000.

Cumbo, Charles C.; and Bhatia, Kamlesh K., to Du Pont de Nemours, E. I., and Company. Process for the production of butanediol. 3,929,915, Cl. 260-635.00E.

Cummins Engine Company, Inc.: *See—*
Bugelski, William G.; and Teasley, Robert E., Jr., 3,929,645.

Curi, Eli. Sub-intimal dissector and methods for performing endarterectomies therewith. 3,929,138, Cl. 128-304.000.

Curry, Carlton J.: *See—*
Kardon, Samuel; and Curry, Carlton J., 3,929,289.

Curtin, Denis J., to A. B. Dick Company. Electrophotographic element which includes a photoconductive polyvinyl carbazole layer containing an alicyclic anhydride. 3,929,478, Cl. 96-1.500.

Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., to Allied Chemical Corporation. Production of low molecular weight polyanhydride compounds. 3,929,738, Cl. 260-78.50R.

Cuthbert, Arthur Robert. Filter unit. 3,929,648, Cl. 210-445.000.

Cutler, Morris; and Tamarin, Bernard J., to Vacuum Cleaner Corporation of America, The. Retractable cord reel. 3,929,210, Cl. 191-12.20R.

Czuba, Leonard J.: *See—*
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,929,818.

D & D Associates: *See—*
Hebert, Donald G., 3,929,214.

da Fonseca-Wollheim, Friedrich, to Boehringer Mannheim G.m.b.H. Quantitative determination of blood ammonia. 3,929,581, Cl. 195-103.50R.

Daido Metal Company, Ltd.: *See—*
Morisaki, Nobukazu, 3,928,918.

Daiichi Seiyaku Co., Ltd.: *See—*
Yamauchi, Toshio, 3,929,503.

Daikin Kogyo Co., Ltd.: *See—*
Komo, Tetsuya; Mizobata, Satoshi; Ukaji, Rokuo; and Kamihigoshi, Tutomu, 3,929,920.
Wada, Hiroyuki; Kawakami, Yasumasa; and Kamihigoshi, Tutomu, 3,929,415.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,929,579.

Daisey, James R. Position index device and drafting apparatus combined therewith. 3,928,917, Cl. 33-76.00R.

Dale, James A.; and Leonard, William J., to Dynapol. Fat or oil composition stabilized with polystyrlphenol antioxidant. 3,930,047, Cl. 426-546.000.

D'Alelio, Gaetano F., to Du Pont de Nemours, E. I., and Company. Polymerizing bis-maleimides and polyimides therefrom. 3,929,713, Cl. 260-32.600.

Dalton, Harrison Lee. Tractor-trailer pulling and guiding device. 3,929,198, Cl. 180-14.00A.

Dalzell, Haldean Cloyce: *See—*
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,929,835.

D'Amico, John Joseph, to Monsanto Company. 1,1-Di(aminoalkylthio)-2,2-dicyanoethylenes. 3,929,857, Cl. 260-465.50R.

Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, to Pfizer Inc. Method of using phenoxypropanolpiperazine compounds to lower blood pressure. 3,930,004, Cl. 424-250.000.

Danisch, Rudiger: *See—*
Schabert, Hans-Peter; Danisch, Rudiger; and Strickroth, Erich, 3,929,568.

Darsow, Gerhard; Bottenbruch, Ludwig; and Schnell, Hermann, to Bayer Aktiengesellschaft. Dihalophenyl-bis-(hydroxyarylethers). 3,929,901, Cl. 260-607.00A.

Dart Industries Inc.: *See—*
Castagna, Eugene G., 3,929,932.
Gaylord, Norman G., 3,929,550.
Huerta, James R.; Anderson, Amos R.; and Meyer, Jeffrey C., 3,929,745.
Van Dyck, Emil J.; Malina, Jerry L.; and Schiller, Raymond E., 3,929,545.

Datascope Corporation: *See—*
Laskey, Richard A., 3,929,741.

Daugherty, Carl Francis, Jr. Air conditioning system. 3,929,285, Cl. 236-13.000.

David, Reginald; and Estienne, Jean, to Rhone-Poulenc, S.A. Emulsifiers derived from hydroxycarboxylic acids. 3,929,870, Cl. 260-484.00A.

Davidson, Uryon S., deceased; by Ajamie, Amil J., administrator; and Price, James B., to Motorola, Inc. Fabrication of monocriptalline silicon on insulating substrates utilizing selective etching and deposition techniques. 3,929,528, Cl. 148-175.000.

Davies, Evan Ellis; and Pout, Christopher Ronald, to British Petroleum Company Limited, The. Reforming process using a uranium-containing catalyst. 3,929,624, Cl. 208-139.000.

Davies, Peter Wesley; and Dennison, John Philip, to International Nickel Company, Inc., The. Grain refining of metals and alloys. 3,929,467, Cl. 75-93.00G.

Davies, Thomas Ellis; and Hopkins, Hubert Brian, to Dow Chemical Company, The. Polystyrene. 3,929,936, Cl. 260-892.000.

Davis, James E.: *See—*
Seni, Leonard S.; Davis, James E.; and Harrison, Henry R., 3,929,652.
Davis, John M., to Du Pont de Nemours, E. I., and Company. Process for stabilizing polyamides. 3,929,725, Cl. 260-45.75C.
Day, Howard E.: *See—*
Cottam, Stephen M.; Day, Howard E.; and Griffith, William A., 3,929,597.
Day, John T.; and Hollick, John G., to USM Corporation. Process for forming microporous sheet. 3,929,949, Cl. 264-46.400.
Dayco Corporation: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,929,957.
De Beers Industrial Diamond Division Limited: *See—*
Caveney, Robert John, 3,929,432.
De Staat der Nederlanden, te dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie: *See—*
Spanjersberg, Arie Adriaan, 3,930,228.
Debras, Maurice: *See—*
Leroy, Pierre; Debras, Maurice; Cadart, Michel; and Saleil, Jean, 3,929,458.
De Brou, Michel; and Den Tandt, Claude, to PB Gelatines. Gelatin compositions. 3,930,052, Cl. 426-576.000.
Dec International Inc.: *See—*
Schluckbier, Gary W., 3,929,103.
Deerfield, Alan J.: *See—*
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., 3,930,232.
Deering Milliken Research Corporation: *See—*
Farmer, Larry B.; Hendrix, James E.; and Kuhn, Hans H., 3,929,406.
Gilpatrick, Michael W., 3,930,096.
Hendrix, James E.; and Kuhn, Hans H., 3,929,013.
Deets, Gary L.: *See—*
Bak, Bruce S.; Deets, Gary L.; and Pokigo, Francis J., 3,929,722.
Deguchi, Takashi: *See—*
Yamahara, Takeshi; Deguchi, Takashi; and Nakamura, Shinji, 3,929,773.
Degueldre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, to Solvay & Cie. Catalytic material for electrodes. 3,929,608, Cl. 204-290.00F.
Dell, Hans-Dieter: *See—*
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,930,003.
Dell'Amico, Daniela Belli; and Calderazzo, Fausto, to Snamprogetti S.p.A. Process for the preparation of carbonyl derivatives. 3,929,973, Cl. 423-417.000.
Delpla, Claude, to Societe Generale de Fonderie. Thermostatic mixing apparatus and a related method for regulating temperature. 3,929,283, Cl. 236-12.00R.
Delta F Corporation: *See—*
Gallagher, John P., 3,929,587.
Deltrol Corporation: *See—*
Harris, John L., 3,930,132.
Demole, Edouard P., to Firmenich S.A. Flavouring and perfuming ingredient. 3,929,839, Cl. 260-347.800.
Demozay, Daniel: *See—*
Pillon, Daniel; Ducret, Jacques; and Demozay, Daniel, 3,929,805.
Denevi, Pietro G.; DiDuca, Mark B.; Slane, Billy J.; and Vence, Thomas D., to Vista Chemical & Fiber Products Inc. Apparatus for reducing preconditioned garbage to a clinkerless combustible. 3,929,628, Cl. 209-36.000.
Denis, Albert P. Anchor studs and shear connectors used in welding. 3,930,136, Cl. 219-99.000.
Dennison, John Philip: *See—*
Davies, Peter Wesley; and Dennison, John Philip, 3,929,467.
Dennison Manufacturing Company: *See—*
Perlis, Barry R.; and Nelson, Michael E., 3,929,480.
Dent, Kenneth Henry; and Challender, Ronald Scott, to United Kingdom Atomic Energy Authority. Apparatus for carrying out ultrasonic inspection of pressure vessels. 3,929,007, Cl. 73-67.80S.
Den Tandt, Claude: *See—*
De Brou, Michel; and Den Tandt, Claude, 3,930,052.
Dentsply Research & Development Corporation: *See—*
Gonser, Donald I., 3,929,137.
Denunzio, Anthony, to Spector, George. Sanding cone. 3,928,948, Cl. 51-379.000.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of 1H-triazolo [4,5-c]pyridine-7-carboxylic acids and esters. 3,929,812, Cl. 260-295.50B.
Derleth, Helmut: *See—*
Kuhrt, Winfried; Derleth, Helmut; and Fischer, Hermann, 3,929,682.
Derrick Manufacturing Corporation: *See—*
Ennis, Robert E.; and Derrick, Robert G., 3,929,642.
Derrick, Robert G.: *See—*
Ennis, Robert E.; and Derrick, Robert G., 3,929,642.
De Simone, Robert S.; and Ramsden, Hugh E., to Rhodia, Inc. Process for the selective allylation of ortho alkoxy phenols. 3,929,904, Cl. 260-613.00D.
Deutsch Fastener Corporation: *See—*
Gulistan, Bulent, 3,929,360.
Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Production of glide and portamento in an electronic musical instrument. 3,929,053, Cl. 84-1.240.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Biberbach, Peter; Dietschmann, Werner; and Lubke, Hans-Joachim, 3,929,595.
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, 3,929,907.
Deutsche Texaco Aktiengesellschaft: *See—*
Flis, Klaus-Jurgen, 3,929,656.
Deutsche Vergaser GmbH & Co. Kommanditgesellschaft: *See—*
Chattopadhayay, Asoke; and Schmidt, Karl, 3,929,114.
Dever, John Alden, to Honeywell Inc. Function generator circuit. 3,930,202, Cl. 328-142.000.
Devers, Melvin W.; and Felske, William L., to General Motors Corporation. Cast in place gas turbine containment ring and method of manufacture. 3,928,963, Cl. 60-39.660.
Devillers, Julien Albert, to Intercontinental Trading Company - Intraco. Apparatus for machining the angles of a plate. 3,928,945, Cl. 51-80.00A.
DeVincent, Patsy; Falkowski, John A.; and Wiechart, John F., to General Motors Corporation. Tube to block mounting assembly. 3,929,356, Cl. 285-305.000.
DeVincent, Patsy; and Wiechart, John F., to General Motors Corporation. Quick connect coupling with tandem snap rings. 3,929,357, Cl. 285-319.000.
De Vore, Ellen G., to Pierce, Louis B. Head rest. 3,929,309, Cl. 248-118.000.
Diagnostic Instruments, Inc.: *See—*
Hindell, Sidney E., 3,930,156.
Diamond International Corporation: *See—*
Reifers, Richard F., 3,929,564.
Diamond, Martin J.: *See—*
Freedman, Bernard; and Diamond, Martin J., 3,929,723.
Diamond Shamrock Corporation: *See—*
Miller, Robert W.; and Howell, Samuel Garry, 3,929,702.
Dibley, Hugh P. K. Flight path calculator. 3,929,279, Cl. 235-88.00N.
Dick, George H.; and Madden, Thomas J., Jr., to A. B. Dick Company. Ink monitoring and automatic fluid replenishing apparatus for ink jet printer. 3,930,258, Cl. 346-75.000.
Dickinson, Peter D.: *See—*
Blejwas, Walter T., Jr.; and Dickinson, Peter D., 3,930,250.
DiDuca, Mark B.: *See—*
Denevi, Pietro G.; DiDuca, Mark B.; Slane, Billy J.; and Vence, Thomas D., 3,929,628.
Diebel, Leverne G., to Clow Corporation. Method of assembling a thermoplastic sleeve onto a pipe or the like. 3,929,538, Cl. 156-86.000.
Diebolt, Edwin J.; and Hendrickson, Roger A., to Ball Corporation. Tubular hinge assembly. 3,929,165, Cl. 138-121.000.
Diesel Kiki Kabushiki Kaisha: *See—*
Kawase, Koichi; and Suzuki, Yasuhide, 3,929,113.
Dieter Haubold Industrielle Nagelgerate: *See—*
Lange, Wilfried, 3,929,056.
Dietmann, Karl: *See—*
Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, 3,929,764.
Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, 3,929,793.
Dietschmann, Werner: *See—*
Biberbach, Peter; Dietschmann, Werner; and Lubke, Hans-Joachim, 3,929,595.
Digital Systems, Inc.: *See—*
Marantette, William F., 3,930,150.
Di Grasso, Leonard: *See—*
Good, William E.; Di Grasso, Leonard; and Hoffman, James D., 3,928,906.
Dillon, Charles B.: *See—*
Burleson, Cuba L.; and Dillon, Charles B., 3,929,353.
DIM S.A.: *See—*
Giberstein, Bernard, 3,928,989.
Dimitri, Mitchell S.; and Falkehag, Sten I., to Westvaco Corporation. Composites of lignin and biologically active materials. 3,929,453, Cl. 71-101.000.
Dinbergs, Kornelius: *See—*
Schollenberger, Charles S.; Dinbergs, Kornelius; and Kelley, Philip C., 3,929,726.
Dinkler, Leonard R., to General Electric Company. Stand-by power system. 3,930,192, Cl. 320-15.000.
Dipl.-ing. Rudolf Konwitschny: *See—*
Stenz, Rudolf, 3,928,990.
Distillers Company, Limited, The: *See—*
Dunnet, William, 3,930,042.
DiVito, Ronald J.: *See—*
Steck, Howard A.; and DiVito, Ronald J., 3,930,249.
Dix, C. Hewitt: *See—*
Fort, J. Robert; Westphal, James A.; Dix, C. Hewitt; and Juiles, Donald R., 3,930,145.
Dixon, Babette, Trustee: *See—*
Dixon, Paul H., 3,929,176.
Dixon, Paul H., to Dixon, Babette, Trustee. Machine for automatically driving threaded fasteners. 3,929,176, Cl. 144-32.000.
Dixon, Rolland E., to Phillips Petroleum Company. Process for making synthetic fuel gas from crude oil. 3,929,430, Cl. 48-211.000.
Dobkin, Robert C., to National Semiconductor Corporation. Input supply independent circuit. 3,930,172, Cl. 307-297.000.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.

Dohnert, Edward H., to Ecodyne Corporation. Water treating apparatus. 3,929,640, Cl. 210-195.000.

Doi, Hiroshi: *See—*
Kanomata, Ichiro; Doi, Hiroshi; and Tamura, Hifumi, 3,930,155.

Doig, Kingsley Ferguson: *See—*
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, 3,929,469.

Dolfini, Joseph E.: *See—*
Perrella, Donald J.; and Dolfini, Joseph E., 3,929,777.

Doll, Franz, to Grohe, Bernd. Thermostat for controlling a liquid mixer. 3,929,282, Cl. 236-12.00R.

Dombroski, John R.; and Caldwell, John R., to Eastman Kodak Company. Saturated polyester useful as low shrink additive for molding compositions containing unsaturated polyesters. 3,929,868, Cl. 260-475.00P.

Domtar Limited: *See—*
Akkerman, Allardus A., 3,929,274.

Donaldson, Desmond M.; and Millard, Gregory S. T., to Borg-Warner Corporation. Fluid diverter device with pressure relief valve. 3,929,643, Cl. 210-117.000.

Dorcfeev, Vyacheslav Semenovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorcfeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.

Dorleijn, Jan Willem Frederik: *See—*
Druyvesteyn, Willem Frederik; and Dorleijn, Jan Willem Frederik, 3,930,242.

Dornier System GmbH.: *See—*
Kreeb, Helmut; Hauser, Gerhard; and Kogler, Klaus, 3,929,136.

Dovman, Nathan. Jalousie louver bracket. 3,928,937, Cl. 49-403.000.

Dow Chemical Company, The: *See—*
Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,930,019.
Davies, Thomas Ellis; and Hopkins, Hubert Brian, 3,929,936.
Leddy, James J.; and Gritzner, Gerhard, 3,929,506.
Niles, Earl Thomas, 3,929,530.
Olstowski, Franciszek; and Parrish, Donald B., 3,929,709.
Steward, David L.; and Tong, Wen-Hong, 3,929,991.

Dowell, Arthur M., Jr.: *See—*
Burke, Noel I.; Dowell, Arthur M., Jr.; Talty, Robert D.; and Kremer, Kenneth J., 3,930,035.

Dowty Mining Equipment Limited: *See—*
Parker, James Eric; and Hill, Nigel, 3,928,981.

Drabek, Jozef, to Ciba-Geigy Corporation. Dithiophosphoric acid esters. 3,929,817, Cl. 260-307.00C.

Drace, Lawrence V. Pants hanging apparatus. 3,929,233, Cl. 214-1.00R.

Drake, Charles A., to Phillips Petroleum Company. Sulfolane or aqueous sulfolane as diluent for preparation of unsaturated nitriles from lower unsaturated nitriles and olefins. 3,929,860, Cl. 260-465.900.

Dravo Corporation: *See—*
Malcolm, Donald B., 3,929,219.

Drelich, Arthur H.; and Lukacs, George J., to Johnson & Johnson. Migration control resin compositions and methods of using the same on porous materials. 3,930,073, Cl. 427-341.000.

Drelich, Arthur H.; and Lukacs, George J., to Johnson & Johnson. Synthetic resin compositions and methods of applying the same to porous materials to control migration thereon. 3,930,074, Cl. 427-341.000.

Dresser Industries, Inc.: *See—*
Sharki, Martin James, 3,929,014.
Shieh, Ming K., 3,930,174.

Druyvesteyn, Willem Frederik; and Dorleijn, Jan Willem Frederik, to U.S. Philips Corporation. Magnetic device having domains. 3,930,242, Cl. 340-174.0TF.

DSO "Textil": *See—*
Petrov, Georgi Mitov; Iliev, Iliya Marinov; and Ilov, Rangel Georgiev, 3,928,957.

Dubovitsky, Fedor Ivanovich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.

DuBrow, Paul L.; and Frisque, Alvin J., to Nalco Chemical Company. Use of water-in-oil emulsions of water soluble vinyl addition polymers to improve the efficiency of jet powered ships. 3,929,088, Cl. 115-14.000.

Ducret, Jacques: *See—*
Pillon, Daniel; Ducret, Jacques; and Demozay, Daniel, 3,929,805.

DuFaure, Pierre: *See—*
Bouillon, Claude; DuFaure, Pierre; and Rosenbaum, Georges, 3,929,986.

Duke, Roy B., to Marathon Oil Company. Recovery of organic matter from organic mineral-containing deposits. 3,929,193, Cl. 166-303.000.

Dukek, William G., to Exxon Research & Engineering Co. Electrostatic charge reduction in filter-separators. 3,929,641, Cl. 210-73.000.

Dunn, Wendell E., Jr., to Titanium Technology, N.V. Novel titanium dioxide composition. 3,929,501, Cl. 106-300.000.

Dunnet, William, to Distillers Company, Limited, The. Production of vodka. 3,930,042, Cl. 426-475.000.

Dunwood Development Corporation: *See—*
Wood, Ralph E., 3,929,606.

Du Pont de Nemours, E. I., and Company: *See—*
Beske, Grant A., 3,929,658.
Beyer, Elmo M., Jr.; and Quebedeaux, Bruno, Jr., 3,929,447.
Cooper, Terence Alfred; and Logothetis, Anestis Leonidas, 3,929,749.
Cooper, Terence Alfred; and Khan, Ausat Ali, 3,929,752.
Cumbo, Charles C.; and Bhatia, Kamlesh K., 3,929,915.
D'Alelio, Gaetano F., 3,929,713.
Davis, John M., 3,929,725.
Graham, Boynton, 3,929,659.
Herkes, Frank Edward, 3,929,882.
Higgins, James Francis, 3,929,500.
Hochberg, Seymore, 3,929,693.
Klimaszewski, Charles Stanley, Jr., 3,929,943.
Klopping, Hein Louis, 3,930,010.
Leverett, Glenn Frederick, 3,929,721.
Moore, Albert Lloyd; and Tang, Walter Kwei-Yuan, 3,929,934.
Patterson, Frank Knowles, 3,929,674.
Short, Oliver Alton, 3,930,093.
Squire, Edward Noonan, 3,929,889.
Streicher, Michael A., 3,929,473.
Taub, Steven I., 3,929,968.
Weaver, Thomas Dean, 3,929,772.

Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of alkylamides. 3,929,845, Cl. 260-404.000.

Durden, John Apling, Jr. Carbamate pesticidal compositions. 3,930,002, Cl. 424-246.000.

Durling, Harold, to Midland-Ross Corporation. Pneumatic brake system for a tractor-trailer vehicle including an anti-lock control valve in the trailer brake system. 3,929,381, Cl. 303-21.00F.

Durr, Dieter; and Pissiotas, Georg, to Ciba-Geigy Corporation. Phenylformamidine derivatives. 3,929,883, Cl. 260-564.0RF.

Dursch, Walter: *See—*
Beermann, Claus; Knittel, Volker; and Dursch, Walter, 3,929,874.

Dynafoil, Inc.: *See—*
Cline, David J., 3,929,084.

Dynapol: *See—*
Dale, James A.; and Leonard, William J., 3,930,047.

E. R. Squibb & Sons, Inc.: *See—*
Breuer, Hermann, 3,929,774.
Breuer, Hermann; and Treuner, Uwe D., 3,929,778.
Breuer, Hermann, 3,929,782.
Clark, K. Warren, 3,930,026.
Denzel, Theodor; and Hoehn, Hans, 3,929,812.
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., 3,930,022.
Krapcho, John; and Turk, Chester Frank, 3,929,783.
Murty, Hari S.; Gara, Siva K.; and Murty, Dasika R., 3,929,981.
Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,929,814.
Perrella, Donald J.; and Dolfini, Joseph E., 3,929,777.
Treuner, Uwe D.; and Breuer, Hermann, 3,929,776.
Wojnar, Robert John; Brittain, Russell James; Bernstein, Jack; and Losee, Kathryn Alice, 3,930,005.
Yale, Harry Louis, 3,929,787.

Eagle-Picher Industries, Inc.: *See—*
Nedeljkovic, Arsenije I., 3,930,062.

Eastman, Brian G.: *See—*
Salava, Roger F.; Eastman, Brian G.; and King, George W., 3,930,251.

Eastman Kodak Company: *See—*
Arcesi, Joseph A.; and Rauner, Frederick J., 3,929,489.
Dombroski, John R.; and Caldwell, John R., 3,929,868.
Gammans, William J., 3,929,873.
Landholm, Richard A.; Haase, Jan R.; and Krutak, James J., Sr., 3,929,760.
McCollum, Anthony W.; and Hull, David C., 3,929,867.
Ponticello, Ignazio Salvatore; and Perry, Ernest John, 3,929,482.
Ross, Robert E., 3,929,484.
Snapp, Thomas C., Jr.; and Blood, Alden E., 3,929,846.
Snapp, Thomas C., Jr.; and Blood, Alden E., 3,929,847.
Williams, Francis A., 3,929,304.

Eastwood, Chester A.; and Eastwood, Clyde A. Pipe holding apparatus. 3,929,325, Cl. 269-218.000.

Eastwood, Clyde A.: *See—*
Eastwood, Chester A.; and Eastwood, Clyde A., 3,929,325.

Eaton Corporation: *See—*
Behar, Marcel N., 3,929,200.
Ekstrom, George A., 3,929,244.
Keene, Derek K.; and Wahl, James A., 3,929,346.
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., 3,929,382.
Stratynski, Eugene Edward, 3,929,314.
Talbot, Donald Thomas, 3,928,992.
Urban, John A.; and Hopkins, Gary Lee, 3,929,383.

Eckardt, Andras: *See—*
Constantin, Gurgui N.; Luca, Vasile; Eckardt, Andras; and Ciulacu, Paraschiv I., 3,930,088.

Eckhardt, Fred A., to McDonnell Douglas Corporation. Cryogenic connector. 3,929,358, Cl. 285-353.000.

Ecodyne Corporation: *See—*
Dohnert, Edward H., 3,929,640.

Edo - Aire Mitchell Industries, Inc.: *See—*
Younkin, James R., 3,929,019.
Edwards, Bryant, to Illinois Tool Works Inc. Method for molding a plastic container. 3,929,952, Cl. 264-94.000.
Edwards, John A.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,821.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,822.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,823.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,824.
Edwards, John M.; and Wright, James D., to John Edwards & Associates, Inc. Method of wrapping elongate cylindrical objects. 3,928,939, Cl. 53-32.000.
Edwin Cooper & Company Limited: *See—*
Elliott, John Scotchford; Jayne, Gerald John Joseph; and Askew, Herbert Frank, 3,929,653.
Egan Machinery Company: *See—*
Smith, David J., 3,929,323.
Eguchi, Yukuo: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.
Eilingsfeld, Heinz: *See—*
Ackermann, Otto; and Eilingsfeld, Heinz, 3,929,841.
Einberg, Fred J., to United States of America, Army. New adhesive tetrazole polymers and process of making therefor. 3,929,684, Cl. 260-2.00R.
Einbinder, Harvey. Input keyboards. 3,929,216, Cl. 197-100.000.
Eisai Co., Ltd.: *See—*
Kuwana, Noriaki; Suzuki, Kouichi; and Sugitani, Tooru, 3,929,572.
Eishun, Tsuchida; and Yoshihito, Osada, to Fujikura Cable Works, Ltd., The. Process for preparing polyioncomplexes. 3,929,750, Cl. 260-874.000.
Ek, Lars: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.
Ekstrom, George A., to Eaton Corporation. Material handling vehicle. 3,929,244, Cl. 214-674.000.
Elan Engineering Corporation: *See—*
Kowalski, William S., 3,929,017.
Elco Industries, Inc.: *See—*
Gutshall, Charles E., 3,929,054.
Elder, Mark Alexander: *See—*
Winter, James Douglas; and Elder, Mark Alexander, 3,930,208.
Electro Oxide Corporation: *See—*
Smith, Baynard R.; and Treptow, Arnold W., 3,929,491.
Elektriska Svetsningsaktiebolaget: *See—*
Knipstrom, Karl-Erik; Uhlig, Heinz Oskar; and Boden, Knut Folke Ingemar, 3,930,138.
Eli Lilly and Company: *See—*
Emmick, Thomas L., 3,930,023.
Kornfeld, Edmund C.; and Bach, Nicholas J., 3,929,796.
Eliassen, Gunnar Thure. Transport system. 3,929,079, Cl. 104-172.00B.
Elkins, Edward John. Adjustable drawbar. 3,929,354, Cl. 280-490.00R.
Ellingson Timber Co.: *See—*
Shoemaker, Philip D.; and McQueary, Hobert O., 3,930,110.
Elliott, John Scotchford; Jayne, Gerald John Joseph; and Askew, Herbert Frank, to Edwin Cooper & Company Limited. Lubricant additives. 3,929,653, Cl. 252-46.700.
Ellman, Irving A. Tooth anchoring means and method. 3,928,915, Cl. 32-15.000.
Emi, Satoshi: *See—*
Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, 3,929,963.
Emmick, Thomas L., to Eli Lilly and Company. Insect control with certain synthetic hormones. 3,930,023, Cl. 424-341.000.
Emura, Tomoyuki: *See—*
Itoh, Iko; Sekihara, Takeshi; and Emura, Tomoyuki, 3,929,753.
Enami, Tomotada: *See—*
Morita, Akiyoshi; and Enami, Tomotada, 3,930,122.
Endo Laboratories: *See—*
Fliedner, Leonard J., Jr.; and Pachter, Irwin J., 3,929,887.
Engalitcheff, John, Jr., to Baltimore Aircoil Company, Inc. Method of multi stage injector cooling. 3,929,435, Cl. 55-94.000.
Engel, Phillip Knox: *See—*
Serban, Alexander; and Engel, Phillip Knox, 3,929,837.
Engelhard Minerals & Chemicals Corporation: *See—*
Pfefferle, William C., 3,928,961.
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Hydrolyzed copolymer of acrylonitrile and an unsaturated sulfonic acid. 3,929,740, Cl. 260-79.3MU.
Engelman, Elaine Green; and Neri, Dorothy. Very low carbohydrate baked product. 3,930,055, Cl. 426-644.000.
Ennis, Robert E.; and Derrick, Robert G., to Linatex Corporation of America; and Derrick Manufacturing Corporation. Dewatering system. 3,929,642, Cl. 210-113.000.
Epstein, Norman, to Norman Lock Co. Pickproof cylinder lock. 3,928,993, Cl. 70-419.000.
Era, Masayuki: *See—*
Akahori, Kimihiko; and Era, Masayuki, 3,929,471.
Akahori, Kimihiko; and Era, Masayuki, 3,929,518.
Erath, Robert William: *See—*
Malott, Corwin; and Erath, Robert William, 3,929,197.
ERCO Industries Limited: *See—*
Winfield, John D., 3,929,974.
Erhardt, Klaus: *See—*
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, 3,930,087.
Erico Rail Products Company: *See—*
Geiger, Willard L., 3,929,307.
Ermanis, Felix; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Selective area oxidation of III-V compound semiconductors. 3,929,589, Cl. 204-15.000.
Ernest, Michael Vance: *See—*
Kim, Gwan; and Ernest, Michael Vance, 3,929,965.
Ernst Leitz G.m.b.H.: *See—*
Broemer, Heinz; and Meinert, Norbert, 3,929,495.
Ernst, Richard J., to Xerox Corporation. Glue dispensing assembly. 3,929,260, Cl. 222-88.000.
Erwin, Ransome W., to Austral-Erwin Engineering Co. Preparation of plastic-metal laminates. 3,929,537, Cl. 156-86.000.
Esaki, Leo: *See—*
Chang, Leroy L.; Esaki, Leo; and Ludeke, Rudolf, 3,929,527.
Escher Wyss G.m.b.H.: *See—*
Holik, Herbert; and Mueller, Karl, 3,929,560.
Escher Wyss Limited: *See—*
Haller, Walter, 3,929,320.
Eschweiler & Co.: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 3,929,605.
Esseluhn, Werner F.: *See—*
Fegley, Charles R.; and Esseluhn, Werner F., 3,929,259.
Estienne, Jean: *See—*
David, Reginald; and Estienne, Jean, 3,929,870.
Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,403.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,404.
Etablissement Wanderfield & Co.: *See—*
Filter, Walther; and Filter, Claus, 3,929,168.
Ethyl Corporation: *See—*
Appleby, Albert E.; and Simpson, Tommy G., 3,929,637.
Valdo, Alex R., 3,929,425.
Ethylene Plastique: *See—*
Gloriod, Pierre; Levresse, Bernard; and Machon, Jean-Pierre, 3,929,754.
Evans Products Company: *See—*
MacCurdy, William K., 3,929,232.
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., to International Flavors & Fragrances Inc. Process for producing alkylidene alkene halides. 3,929,919, Cl. 260-654.00R.
Exxon Production Research Company: *See—*
Graham, John Wayne; Muecke, Thomas Wayne; and Cooke, Claude Everett, Jr., 3,929,191.
Kostelnicek, Richard J., 3,930,219.
Exxon Research & Engineering Co.: *See—*
Brewster, Phillip William; Hamblin, Peter Collen; and Rutherford, James Pennycook, 3,929,654.
Dukek, William G., 3,929,641.
Henry, H. Clarke; and Gilbert, John B., 3,929,617.
Koh, Kwang K.; Pennington, Robert E.; Vernon, Lonnie W.; and Nahas, Nicholas C., 3,929,431.
Murray, Donald W.; and Pattenden, Warren C., 3,929,651.
Oswald, Alexis A., 3,929,849.
Saidla, Glen E. W., 3,929,318.
Sinfelt, John H.; Barnett, Allan E.; and Carter, James L., 3,929,619.
Eymard, Pierre Luc: *See—*
Benoit-Guyod, Martine Pierrette; Benoit-Guyod, Jean-Louis Alain; Boucherle, Andre Louis; and Eymard, Pierre Luc, 3,929,869.
Faber, Berry V. Process for preparing low calorie gelatin dessert with bromelain. 3,930,050, Cl. 426-564.000.
Fabrizio, Leonard A.: *See—*
Tybus, Axel W.; and Fabrizio, Leonard A., 3,929,700.
Faget, Maxime A.; Petynia, William W.; and Taub, Willard M., to United States of America, General Counsel-Code GP. Space vehicle system. 3,929,306, Cl. 244-162.000.
Fagniart, Gaston, to Societe Anonyme dite: Boracier. Packaging machine. 3,928,940, Cl. 53-112.00B.
Fairchild Industries, Inc.: *See—*
Thurston, Franklin J.; Schendeler, Franciscus J.; and Jounen, Joseph C., 3,929,217.
Falchle, Jorg: *See—*
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.
Falkehag, Sten I.: *See—*
Dimitri, Mitchell S.; and Falkehag, Sten I., 3,929,453.
Falkowski, John A.: *See—*
DeVincent, Patsy; Falkowski, John A.; and Wiechart, John F., 3,929,356.
Fanelli, Anthony Joseph: *See—*
Rauch, Francis Clyde; Fanelli, Anthony Joseph; and Blank, Gerlinde Metzler, 3,929,917.
Farallon Industries, Inc.: *See—*
Shamlian, Ralph B., 3,929,548.

Farkas, Gabor: *See—*
Seims, Warren J.; and Farkas, Gabor, 3,928,902.

Farmer, Larry B.; Hendrix, James E.; and Kuhn, Hans H., to Deering Milliken Research Corporation. Method of detecting defects and composition therefor. 3,929,406, Cl. 8-164.000.

Farr, Glyn Phillip Reginald, to Girling Limited. Power assisted master cylinder assemblies. 3,928,970, Cl. 60-562.000.

Farrell, Kenneth L. Vehicle-supported structure stabilizer. 3,929,370, Cl. 296-23.0MC.

Farrissey, William J., Jr.: *See—*
Alberino, Louis M.; and Farrissey, William J., Jr., 3,929,733.
Alberino, Louis M.; Farrissey, William J., Jr.; and Rose, James S., 3,930,097.

Fattore, Vittorio: *See—*
Buonomo, Franco; Fattore, Vittorio; Zanoni, Gianfranco; and Notari, Bruno, 3,929,681.

Fauke, Allen R.: *See—*
Buriks, Rudolf S.; and Fauke, Allen R., 3,929,632.
Buriks, Rudolf S.; and Fauke, Allen R., 3,929,635.

Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, to Boehringer Mannheim G.m.b.H. N(6)-disubstituted adenosine compounds. 3,929,763, Cl. 260-211.50R.

Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, to Boehringer Mannheim G.m.b.H. N(6)-disubstituted adenosine compounds. 3,929,764, Cl. 260-211.50R.

Favre, Bernard: *See—*
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 3,930,105.

Fawn Engineering Corporation: *See—*
Wittern, Francis A.; and Wirstlin, Arthur N., 3,929,255.

Federal-Mogul Corporation: *See—*
Clark, William E., 3,929,341.

Federer, Fritz: *See—*
Britschinn, Horst; Federer, Fritz; and Neumann, Henning, 3,928,879.

Fedorov, Valery Ionovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Fegley, Charles R.; and Esseluhn, Werner F. Chemical dispensing anti-burglar device. 3,929,259, Cl. 222-61.000.

Feichtner, John D.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,970.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,976.

Feld, Stanley J. FM monitoring system. 3,930,200, Cl. 325-134.000.

Feldkirchner, Harlan L.: *See—*
Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., 3,929,615.

Felske, William L.: *See—*
Devers, Melvin W.; and Felske, William L., 3,928,963.

Feltzin, Joseph: *See—*
Baldino, James P.; and Feltzin, Joseph, 3,929,866.

Feminella, Joseph V.; Melachouris, Nicholas; and Lauck, Robert M., to Stauffer Chemical Company. Use of modified dried whey as a flavor enhancer in foods. 3,930,056, Cl. 426-646.000.

Ferguson, Alisdair Cullen; McGregor, John; and MacPherson, Alastair George, to Burroughs Corporation. Small micro program data processing system employing multi-syllable micro instructions. 3,930,236, Cl. 340-172.500.

Ferranti, Limited: *See—*
Nuttall, Roy; and Rowbotham, Clifford, 3,929,526.

Ferri, Johann Walter, to Luwa AG. Apparatus for removing waste from a blowing room machine. 3,928,892, Cl. 19-200.000.

Ferrovanadium Corporation N.I.: *See—*
Miyoshi, T. Kenneth; Berthold, Cornelius E.; Stephens, Frank M., Jr.; and Schellinger, Alfred K., 3,929,461.

Fiberglas Canada Ltd.: *See—*
Clark-Monks, Colin, 3,929,497.

Fidi, Werner; and Piribauer, Herbert, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Electret diaphragm microphone with means to corrugate the diaphragm when in an overstressed condition. 3,930,128, Cl. 179-111.00R.

Fields, Ellis K.: *See—*
Cerefice, Steven A.; and Fields, Ellis K., 3,929,711.

Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich. Method of heat treating linear long-length steel articles, apparatus for effecting said method and articles produced thereby. 3,929,524, Cl. 148-150.000.

Filter, Claus: *See—*
Filter, Walther; and Filter, Claus, 3,929,168.

Filter, Walther; and Filter, Claus, to Vereinigte Osterreichische Eisen-und Stahlwerke-Alpine Montan Aktiengesellschaft; and Etablissement Wanderfield & Co. Take-off regulator. 3,929,168, Cl. 139-99.000.

Financial Mining - Industrial and Shipping Corporation: *See—*
Frangiskos, Antonios; and Gambopoulos, Theodor, 3,929,627.

Findlay, Donald Urquhart; McGaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, to Canadian Industries Limited. Method for producing oriented plastic shotshells. 3,929,959, Cl. 264-292.000.

Findlay, Donald Urquhart; McCaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, to Canadian Industries Limited. Method for producing oriented plastic shotshells. 3,929,960, Cl. 264-292.000.

Finkl, Charles W., to A. Finkl & Sons Company. Hot work forging die block and method of manufacture thereof. 3,929,423, Cl. 29-180.000.

Firmenich S.A.: *See—*
Demole, Edouard P., 3,929,839.

Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted O-[aminosulfonyl]-glycolic anilides herbicides. 3,929,454, Cl. 71-103.000.

Fischer, Hermann: *See—*
Kuhrt, Winfried; Derleth, Helmut; and Fischer, Hermann, 3,929,682.

Fischli, Albert Eduard; Klaus, Michael Josef; Mayer, Hans Johann; and Wick, Alexander Eduard, to Hoffmann-La Roche Inc. Preparation of cyclopentane derivatives. 3,929,853, Cl. 260-456.00R.

Fisher, Joseph J.: *See—*
May, Earl L.; and Fisher, Joseph J., 3,929,444.

Fisher Scientific Company: *See—*
Mansfield, Ernest Bryant, 3,929,584.

Fitzgibbon, Alan: *See—*
Todd, Lamar S.; Fitzgibbon, Alan; Carosella, Michael C.; and Hilty, Donald C., 3,929,464.

Fitzi, Konrad, to Ciba-Geigy Corporation. 2-Substituted-4(5)-(aryl)-5(4)-(2,3 or -4-pyridyl)-imidazoles. 3,929,807, Cl. 260-294.80R.

Fleissner, Heinz, to Vepa Aktiengesellschaft. Sieve drum device for the bonding and strengthening of felt and similar products. 3,928,920, Cl. 34-115.000.

Fleming, Robert W.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,929,802.

Fletcher, George M. Watercraft for scavenging oil spillage. 3,929,644, Cl. 210-242.000.

Flichman, Howard John: *See—*
Boggs, Luther Miles; and Flichman, Howard John, 3,929,006.

Fliedner, Leonard J., Jr.; and Pachter, Irwin J., to Endo Laboratories. Alkylenepoly(aralkylamines) and the salts thereof. 3,929,887, Cl. 260-570.50P.

Flinner, Vaughn D.; and Sprang, Richard W., to Mansfield Sanitary Inc. Sillcock incorporating an antisiphon and backflow preventer. 3,929,150, Cl. 137-218.000.

Flis, Klaus-Jurgen, to Deutsche Texaco Aktiengesellschaft. Drawing oil. 3,929,656, Cl. 252-56.00R.

Foell, Theodore J., to American Home Products Corporation. P-Glu-D-Phe-Trp-Ser-Tyr-D-Arg-Leu-Arg-Pro-Gly-NH_2 and intermediates. 3,929,759, Cl. 260-112.5LH.

Fooladi, Mike Mehdi. N-1-Naphthylcarbamic acid-2,4,5-trichlorophenol ester. 3,929,865, Cl. 260-471.00C.

Ford Motor Company: *See—*
Harrison, Robert S.; Medrick, John D.; and Nowroski, Alvin P., 3,929,942.
Kinstle, James F., 3,929,935.
Rao, V. Durga Nageswar; and Telang, Yeshwant P., 3,930,071.
Stojek, Dieter, 3,929,395.

Ford, Ronald Alfred: *See—*
Nicholas, Keith Harlow; Ford, Ronald Alfred; and Beale, Julian Robert Anthony, 3,929,512.

Forgione, Peter Salvatore; and Robbins, Howard M., to American Cyanamid Company. Creatine phosphokinase test indicator. 3,929,580, Cl. 195-99.000.

Fort, J. Robert; Westphal, James A.; Dix, C. Hewitt; and Juiles, Donald R., to Geophysical Systems Corporation. Data acquisition and processing system. 3,930,145, Cl. 235-151.300.

Forte, Robert D. Outdoor advertising sign. 3,928,929, Cl. 40-125.00K.

Foster, Alan. Sheet material transport. 3,929,267, Cl. 226-74.000.

Fothergill, Graham Alwyn; Osbond, John Mervyn; and Wickens, James Charles, to Hoffmann-La Roche Inc. 2-(2-Lower alkylamino-1-hydroxy-ethyl)-substituted benzofurans. 3,929,836, Cl. 260-346.20R.

Fournier, Daniel R.: *See—*
Monpetit, Louis A.; and Fournier, Daniel R., 3,929,108.

Francis, Brian: *See—*
Wookey, Norman; Jackson, Arthur Frederick; Collins, Michael Clive; and Francis, Brian, 3,930,048.

Frangiskos, Antonios; and Gambopoulos, Theodor, to Financial Mining - Industrial and Shipping Corporation. Magnetic beneficiation for magnesite ores. 3,929,627, Cl. 209-9.000.

Frank, Robert G., to PPG Industries, Inc. Roll forming heat-softened glass sheets. 3,929,441, Cl. 65-106.000.

Franke, Friedrich: *See—*
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, 3,929,955.

Frantzen, John J., to Buckbee-Mears Company. Sealing apparatus for continuous moving web. 3,929,551, Cl. 156-345.000.

Fredin, Bo; and Leine, Lars, to AB Asea-Atom. Nuclear reactor with groups of elongated absorber units carried by control rods. 3,929,565, Cl. 176-35.000.

Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable polyolefins containing sulfenyl halides. 3,929,723, Cl. 260-45.70S.

French, Park, to Sterndent Corporation. Variable intensity dental light. 3,930,149, Cl. 240-41.150.
Frenyo, Pal; Bicker, Wilhelm; and Hellmuth, Werner, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Mining machine. 3,929,378, Cl. 299-64.000.
Fricko, John J., to General Motors Corporation. Comfort clip for a shoulder belt of a vehicle occupant restraint belt system. 3,929,351, Cl. 280-150.0SB.
Fried, John H.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,821.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,822.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,823.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,824.
Friedman, Robert H., to Getty Oil Company. Process for treatment of wells with nitrogen tetroxide. 3,929,192, Cl. 166-300.000.
Friedrich, Maria S.: *See—*
Grasselli, Robert K.; and Friedrich, Maria S., 3,929,899.
Frisque, Alvin J.: *See—*
DuBrow, Paul L.; and Frisque, Alvin J., 3,929,088.
Fromson, Howard A. Electroplated anodized aluminum articles. 3,929,594, Cl. 204-42.000.
Fuhrmann, Robert; Sifniades, Stylianos; and Tunick, Allen Abraham, to Allied Chemical Corporation. Process for the manufacture of ketone derivatives. 3,929,885, Cl. 260-566.00A.
Fuji Photo Film Co., Ltd.: *See—*
Asano, Yoshio, 3,930,264.
Fujita, Susumu, 3,930,262.
Kanda, Masao; and Suefuji, Mineo, 3,929,097.
Kubotera, Kikuo; Mizuki, Eiichi; Fujiwara, Tadahiro; and Tsuji, Nobuo, 3,929,481.
Miyakawa, Masami; Yoneyama, Masakazu; and Yamamoto, Nobuo, 3,929,485.
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, 3,929,604.
Fujii, Akio: *See—*
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, 3,929,993.
Fujikura Cable Works, Ltd., The: *See—*
Eishun, Tsuchida; and Yoshihito, Osada, 3,929,750.
Fujita, Susumu, to Fuji Photo Film Co., Ltd. Shutter speed control means. 3,930,262, Cl. 354-267.000.
Fujiwara, Susumu: *See—*
Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, 3,930,141.
Fujiwara, Tadahiro: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; Fujiwara, Tadahiro; and Tsuji, Nobuo, 3,929,481.
Fukita, Tadazumi: *See—*
Kanzaki, Toshihiko; Fukita, Tadazumi; and Kono, Yoichiro, 3,929,577.
Funabiki, Kaoru: *See—*
Aiba, Yoshikazu; Furumori, Takaki; Shinpo, Shozo; and Funabiki, Kaoru, 3,929,666.
Funck, Donald E.: *See—*
Plumberg, Leonard G., 3,930,226.
Furgal, Henry Paul: *See—*
Corliss, Glenn Arthur; and Furgal, Henry Paul, 3,930,033.
Furumori, Takaki: *See—*
Aiba, Yoshikazu; Furumori, Takaki; Shinpo, Shozo; and Funabiki, Kaoru, 3,929,666.
Furumura, Kyozarburo: *See—*
Kinoshi, Masao; and Furumura, Kyozarburo, 3,929,523.
Fyans Frank; and Biroczky, Steve I. Dye tube for compressive packaged dyeing. 3,929,301, Cl. 242-118.110.
G. D. Searle & Co.: *See—*
Jokay, Louis, 3,930,057.
G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli: *See—*
Seragnoli, Ariosto, deceased; and Romano, Elazar, legal representative, 3,929,238.
G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 3,929,326.
GAF Corporation: *See—*
Barabas, Eugene S., 3,929,735.
Barabas, Eugene S.; and Grosser, Frederick, 3,929,739.
Moynahan, Edward B.; Brunner, August H., Jr.; and Skreckoski, Gerald R., 3,929,466.
Szymber, Oleg; and Brushenko, Anatoli, 3,929,099.
Gajewski, Vincent J.: *See—*
Graefe, Peter U.; Gajewski, Vincent J.; and Jimenez, Ismael A., 3,929,730.
Galantay, Eugene E., to Sandoz, Inc. 1-Phenyl-2, 3-butadien-1-ols. 3,929,902, Cl. 260-612.00R.
Gallagher, John P., to Delta F Corporation. Apparatus and method for maintaining a stable electrolyte in oxygen analysis. 3,929,587, Cl. 204-1.00T.
Gallagher, Ruth E., to Stauffer Chemical Company. Rigid plastic admixed with crosslinked acrylate/vinyl chloride interpolymer. 3,929,933, Cl. 260-876.00R.
Gambopoulos, Theodor: *See—*
Frangiskos, Antonios; and Gambopoulos, Theodor, 3,929,627.
Gammans, William J., to Eastman Kodak Company. Oxidation of polyethylene glycols to dicarboxylic acids. 3,929,873, Cl. 260-531.00R.
Gans, Charles C. Knock-down sofa. 3,929,375, Cl. 297-440.000.
Ganzinotti, Jean Victor, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Inflatable water-retaining barrier. 3,928,980, Cl. 61-29.000.
Gara, Siva K.: *See—*
Murty, Hari S.; Gara, Siva K.; and Murty, Dasika R., 3,929,981.
Garcia, Paulina P.: *See—*
Borror, Alan L.; and Garcia, Paulina P., 3,929,797.
Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy AG. Heterocyclic substituted fluorans. 3,929,831, Cl. 260-326.340.
Garoff, Kenton: *See—*
Zinn, Mortimer H.; Taylor, George W.; and Garoff, Kenton, 3,930,204.
Garretson, Owen L. Float shut off valve for liquefied petroleum gas tank fillers. 3,929,155, Cl. 137-430.000.
Garrett Corporation, The: *See—*
Chirgwin, Keith M., 3,930,175.
Gary Aircraft Corporation: *See—*
Smith, Pat E., 3,929,630.
Gasdoue, Rene: *See—*
Quang, Pham Kim; and Gasdoue, Rene, 3,930,257.
Gaston County Dyeing Machine Company: *See—*
Turner, James Keith; and Parsons, Gary L., 3,929,639.
Gates, David S.: *See—*
Hosler, Peter; and Gates, David S., 3,929,923.
Gates Rubber Company, The: *See—*
Miller, Richard C., 3,929,788.
Gattuso, Marion J., to Universal Oil Products Company. Additives for hydrocarbonaceous materials. 3,929,655, Cl. 252-51.50R.
Gaudry, Paul Emile, to Consolidated Foods Corporation. Seal for disposable dust bags for vacuum cleaners. 3,929,437, Cl. 55-367.000.
Gaugenmaier, Karl: *See—*
Csordas, Elemer; Gaugenmaier, Karl; and Kotitschke, Gerhard, 3,929,065.
Gaul, Ray A.; and Penoli, Raymond J., Jr. Lock. 3,928,991, Cl. 70-364.00A.
Gawlinski, Louis S. Inclining sun chair. 3,929,373, Cl. 297-19.000.
Gay, Sylvester Parker, Jr. Method and means for producing stereoscopic contour maps. 3,928,925, Cl. 35-40.000.
Gaylord, Norman G., to Dart Industries Inc. Process for promoting polyolefin adhesion. 3,929,550, Cl. 156-306.000.
Gazzarrini, Franco; Aguzzi, Paolo; and Corsini-Mena, Adriana, to Montedison S.p.A. Process for preparing luminescent materials based on oxysulphides. 3,929,665, Cl. 252-301.40S.
Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Frenyo, Pal; Bicker, Wilhelm; and Hellmuth, Werner, 3,929,378.
GeGa Gesellschaft fur Gasetechnik Lotz KG: *See—*
Lotz, Horst K.; and Otto, Bernhard, 3,929,324.
Gehrig, Heinz; Linge, Hermann; and Wagner, Sepp, to BASF Farben und Fasern A.G. Non-woven webs of filaments of synthetic high molecular weight polymers and process for the manufacture thereof. 3,929,542, Cl. 156-167.000.
Geiger, Willard L., to Erico Rail Products Company. Railway signal system with speed determined movement detector. 3,929,307, Cl. 246-130.000.
Gejyo, Tetsuo: *See—*
Kudo, Tetsuichi; Gejyo, Tetsuo; Yoshida, Kazuetsu; and Seki, Michiharu, 3,929,670.
Gelbein, Abraham P.; Sze, Morgan C.; and Paustian, John E., to Lummus Company, The. Production of pyridine nitriles and carboxylic acids. 3,929,811, Cl. 260-295.50R.
Gendron, Walter P. Die counter plate or make-ready for forming box blanks. 3,929,059, Cl. 93-58.300.
General Electric Company: *See—*
Benz, Mark G., 3,929,519.
Dinkler, Leonard R., 3,930,192.
Harnden, John D., Jr., 3,930,183.
Horning, Albert Emerson, 3,929,704.
Kornrumpf, William P.; and Harnden, John D., Jr., 3,930,193.
MacKenzie, Burton Thornley, Jr.; and Wilkus, Edward Vincent, 3,930,104.
Orlando, Charles M.; and Lavallee, Francois A., 3,929,908.
Park, John N.; Steigerwald, Robert L.; and Walker, Loren H., 3,930,196.
Schilling, William F.; and Beltran, Adrian M., 3,928,901.
Smith, Russell M., 3,930,189.
Stern, Hansjoerg, 3,929,002.
Walker, Loren H., 3,930,194.
Westerheid, Robert J., 3,929,166.
General Electric Company Limited, The: *See—*
Oldfield, Lucy Florence, 3,929,440.
General Foods Corporation: *See—*
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., 3,930,034.
General Motors Corporation: *See—*
Devers, Melvin W.; and Felske, William L., 3,928,963.
DeVincent, Patsy; Falkowski, John A.; and Wiechart, John F., 3,929,356.
DeVincent, Patsy; and Wiechart, John F., 3,929,357.
Fricko, John J., 3,929,351.
Green, Raymond J.; and Stevenson, Paul D., 3,929,117.
Hoffman, Willi, 3,929,201.
Klingenmaier, Otto J., 3,929,592.
Maddock, Don G., 3,929,211.
General Signal Corporation: *See—*
Popick, Mitchell A.; Milne, Robert M., III; and Aggarwal, Suresh K., 3,930,209.

General Time Corporation: *See—*
Midland, Richard W.; Bayer, George S.; and Kreiger, Keith H., 3,930,118.

General Tire & Rubber Company, The: *See—*
van Gils, Gerard E.; and Kalafus, Edward F., 3,930,095.
Welch, John A.; and Mitchell, Robert W., 3,929,948.

Geophysical Systems Corporation: *See—*
Fort, J. Robert; Westphal, James A.; Dix, C. Hewitt; and Juiles, Donald R., 3,930,145.

Gerber Products Company: *See—*
Kelly, Vincent J.; Cloud, Larry L.; and Smalligan, Wayne J., 3,930,027.

Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. 2 Substituted-10[4-(2-oxazolidi none-lower alkyl)]-piperazine-dibenzo[b,f]thiepins. 3,929,791, Cl. 260-268.0TR.

Gerlach, Pierre; and Hoet, Roger, to Thomson-CSF. Grid-type electronic tube. 3,930,179, Cl. 313-296.000.

Gerlach, Robert L.; and Rossini, George, to Varian Associates. Ion beam apparatus with separately replaceable elements. 3,930,163, Cl. 250-398.000.

Gerrard Industries Limited: *See—*
Sansum, Robert David, 3,929,172.

Gerring, Ernest Edward Lawrence: *See—*
Aldridge, David Cecil; Borrow, Antony; and Gerring, Ernest Edward Lawrence, 3,930,014.

Gershberg, David Benedict, to American Cyanamid Company. High molecular weight acrylamide polymer production by high solids solution polymerization. 3,929,751, Cl. 260-89.70R.

Gesslein, Georg. Baby carriage. 3,929,372, Cl. 296-28.00B.

Getty Oil Company: *See—*
Friedman, Robert H., 3,929,192.

Giberstein, Bernard, to DIM S.A. Method of manufacture of tubular knitted articles, and articles, particularly tights, obtained by the said method. 3,928,989, Cl. 66-177.000.

Gibson, Louis J. Support means for stacks of articles. 3,929,371, Cl. 296-24.00R.

Gilbert, John B.: *See—*
Henry, H. Clarke; and Gilbert, John B., 3,929,617.

Gilpatrick, Michael W., to Deering Milliken Research Corporation. Composite porous fabric-impervious film article. 3,930,096, Cl. 428-255.000.

Gilson Brothers Co.: *See—*
Koturov, Daniel, 3,929,236.

Girard, Mary Anne: *See—*
Swered, Paul; and Girard, Mary Anne, 3,930,015.

Girguis, Sobhy Labib, to Uni-Cardan AG. Constant velocity torque transmitting universal joint. 3,928,985, Cl. 64-21.000.

Girling Limited: *See—*
Cochrane, Robin Adam, 3,929,162.
Farr, Glyn Phillip Reginald, 3,928,970.

Gittos, Maurice Ward: *See—*
Wiggins, Leslie Frederick; James, John William; and Gittos, Maurice Ward, 3,930,006.

Givler, John D.; Schlotman, Walter F.; and Sipos, David L., to Stanadyne, Inc. Portable shower head. 3,929,287, Cl. 239-102.000.

GKN Transmissions Limited: *See—*
Pagdin, Brian Colin, 3,929,112.

Glaxo Laboratories Limited: *See—*
Weir, Niall Galbraith, 3,929,780.

Glenoit Mills, Inc.: *See—*
Thore, Thomas J., 3,928,986.

Global Marine Inc.: *See—*
Blankenship, Owen Davis; and Anders, Edward Olen, 3,929,083.

Gloriod, Pierre; Levresse, Bernard; and Machon, Jean-Pierre, to Ethylene Plastique. Process for the preparation of ethylene polymers by both free-radical and ionic polymerisation reactions. 3,929,754, Cl. 260-94.90E.

Gluecksmann, Alfred: *See—*
Marans, Nelson S.; and Gluecksmann, Alfred, 3,929,927.

Gobillon, Yves: *See—*
Degueldre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,929,608.

Goetzewerke: *See—*
Beyer, Horst; and Veutgen, Hans-Jurgen, 3,929,181.
Morsbach, Martin; Johren, Paul; and Meuken, Hermann, 3,929,342.

Gof, Sonia M. Portable motor vehicle visual warning indicator. 3,930,227, Cl. 340-81.00R.

Goff, Richard E., Jr.: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., 3,930,090.

Gonser, Donald I., to Dentsply Research & Development Corporation. Sonic warning for electrosurgical device. 3,929,137, Cl. 128-303.140.

Good, Philip C.: *See—*
Siemens, Richard E.; and Good, Philip C., 3,929,468.

Good, William E.; Di Grasso, Leonard; and Hoffman, James D., to Kelsey-Hayes Company. Method of making a turbine regenerative seal. 3,928,906, Cl. 29-460.000.

Goodrum, John W., to United States of America, Air Force. Periodically and alternately accelerating and decelerating rotation rate of a feed crystal. 3,929,557, Cl. 156-617.000.

Goodwin, Frank E. Freeze protection apparatus. 3,929,154, Cl. 137-344.000.

Goodyear Tire & Rubber Company, The: *See—*
Chung, Daniel A., 3,929,729.
Tazuma, James J.; and Zadra, Mario D., 3,929,737.

Gore, Jon S.; and Walk, Charles R., to Honeywell Inc. Rechargeable power source. 3,929,504, Cl. 136-6.0LN.

Gorham, William F.: *See—*
Clendinning, Robert A.; Potts, James E.; and Gorham, William F., 3,929,937.

Gorrissen, Jan, to U.S. Philips Corporation. Method of providing polycrystalline layers of elementtary substances on substrates. 3,930,067, Cl. 427-86.000.

Gortsema, Frank P.: *See—*
Kotval, Peshotan S.; Hatwell, Henri; and Gortsema, Frank P., 3,929,427.

Goto, Kazuo: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Goto, Kenji; and Mitsui, Ryozo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control valve for exhaust gas recirculation system. 3,928,966, Cl. 60-278.000.

Gottlieb, Milton S.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,970.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,976.

Gotze, Bengi: *See—*
Uden, Edward; and Gotze, Bengi, 3,930,115.

Gould Inc.: *See—*
Mao, George W., 3,929,513.

Graefe, Peter U.; Gajewski, Vincent J.; and Jimenez, Ismael A., to Inter-Polymer Research Corporation. Process for preparing polyurethanes employing a mixture of butanediol and phenylene diethanolamine as a chain extender. 3,929,730, Cl. 260-77.5AN.

Graf, Carl R.: *See—*
Hahn, William F.; and Graf, Carl R., 3,929,293.

Grafelmann, Hans: *See—*
Just, Franz-Peter, 3,928,912.

Graham, Boynton, to Du Pont de Nemours, E. I., and Company. Cross-linked rubber/resin binders for chromium dioxide recording members. 3,929,659, Cl. 252-62.540.

Graham, Gerald A. Fire hydrant cap and actuating tool therefor. 3,929,152, Cl. 137-296.000.

Graham, John Wayne; Muecke, Thomas Wayne; and Cooke, Claude Everett, Jr., to Exxon Production Research Company. Method for treating subterranean formations. 3,929,191, Cl. 166-276.000.

Granges Aktiebolag: *See—*
Svensson, Karl Jonas Valter, 3,929,463.

Granquist, William T., to N.L. Industries, Inc. Hydrocarbon cracking utilizing laminar heavy metal aluminosilicates. 3,929,622, Cl. 208-120.000.

Grant, Robert F.: *See—*
Chapman, Francis E.; and Grant, Robert F., 3,929,492.

Graphic Arts Packaging Corporation: *See—*
Smith, William Paul; and Matsuyama, Glen, 3,929,222.

Grass, Alfred. Drawer guide for heavy drawers. 3,929,387, Cl. 308-3.800.

Grasselli, Robert K.; and Friedrich, Maria S., to Standard Oil Company, The. Process for the oxidation of olefins to unsaturated aldehydes and catalysts therefore. 3,929,899, Cl. 260-604.00R.

Grasso, Charles Paul: *See—*
Cross, Barrington; and Grasso, Charles Paul, 3,929,905.

Graversen, Curtis L., to Omark Industries, Inc. Extended pitch saw chain. 3,929,049, Cl. 83-834.000.

Gray, Don N.; and Guilbault, George G., to Owens-Illinois, Inc. Method and apparatus using solid sensor electrode. 3,929,609, Cl. 204-1.00T.

Gray, Thomas H., to Allegheny Ludlum Industries, Inc. Glass-metal sealing alloy. 3,929,470, Cl. 75-122.000.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Microbiocidal polymeric quaternary ammonium compounds. 3,929,990, Cl. 424-78.000.

Green, John Hugh, to International Telephone and Telegraph Corporation. Two relay line circuit. 3,930,126, Cl. 179-19.000.

Green, Raymond J.; and Stevenson, Paul D., to General Motors Corporation. Rotary engine oil tank vent. 3,929,117, Cl. 123-196.00R.

Greene, Michael L.; and Moss, George J., to United States of America, Navy. Line motion and water current disc sensor. 3,929,015, Cl. 73-170.00A.

Greer Hydraulics, Inc.: *See—*
Noah, Russell V., 3,929,313.
Schon, Otmar, 3,929,163.

Gregory, Joseph J.; and Randolph, Jack R. Apparatus for removal of lithography from metal surfaces. 3,928,883, Cl. 15-4.000.

Gregson, Leslie, to Imperial Chemical Industries Limited. Pressure-sensitive transfer elements. 3,930,099, Cl. 428-315.000.

Gridnev, Vitaly Nikiforovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Grier, John D., to Owens-Illinois, Inc. Printing method and apparatus with wire printing elements. 3,929,070, Cl. 101-298.000.

Griffith, Robert M.; and Parkinson, Christopher, to Allied Colloids Limited. Materials and processes for flotation of mineral substances. 3,929,629, Cl. 209-167.000.

Griffith, William A.: *See—*
Cottam, Stephen M.; Day, Howard E.; and Griffith, William A., 3,929,597.

Grimes, Tom: *See—*
Peterson, Henry G.; and Grimes, Tom, 3,928,885.

Grimes, Warren R.: *See—*
Bamberger, Carlos E.; Richardson, Donald M.; and Grimes, Warren R., 3,929,979.

Grimmett, Earl S., to United States of America, Energy Research and Development Administration. Production of charcoal from sawdust in a fluidized bed. 3,929,585, Cl. 201-2.500.

Gritzner, Gerhard: *See—*
Leddy, James J.; and Gritzner, Gerhard, 3,929,506.

Grohe, Bernd: *See—*
Doll, Franz, 3,929,282.

Gross, Alexander. Pressure rollers for chenille machines. 3,929,268, Cl. 226-176.000.

Gross, Josef: *See—*
Barkow, William Henry; and Gross, Josef, 3,930,185.

Grosser, Frederick: *See—*
Barabas, Eugene S.; and Grosser, Frederick, 3,929,739.

Grow Chemical Corporation: *See—*
Offerman, Sidney, 3,929,692.

Gruen, William, to Gruen, William. Composite light source. 3,930,148, Cl. 240-1.00R.

Gruffaz, Max; and Rollet, Bernard, to Rhone-Poulenc, S.A. Mullticellular polymers made from the reaction product of maleic anhydride with a polyimine. 3,929,687, Cl. 260-2.5EP.

Grun Mar Industries, Inc.: *See—*
Margolin, Efraim; and Grunstein, Michael, 3,929,228.

Grunstein, Michael: *See—*
Margolin, Efraim; and Grunstein, Michael, 3,929,228.

GTE Automatic Electric Laboratories Incorporated: *See—*
Bogacz, Frank J., 3,930,146.

Guadagni, Dante G.: *See—*
Leitereg, Theodore J.; Guadagni, Dante G.; and Teranishi, Roy, 3,929,894.

Guarnieri, C. Richard; Lee, Kenneth; and Onton, Aare, to International Business Machines Corporation. Tailored anisotropy magnetic bubble domain material. 3,930,241, Cl. 340-174.0TF.

Gudenau, Heinrich: *See—*
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, 3,929,955.

Guenst, William C., Jr.; and Litschi, Gerold, to W. R. Grace & Co. Plate conveying apparatus. 3,929,046, Cl. 83-409.000.

Guilbault, George G.: *See—*
Gray, Don N.; and Guilbault, George G., 3,929,609.

Gulf Oil Corporation: *See—*
Hedrich, Loren W., 3,929,449.

Gulf Research & Development Company: *See—*
Singerman, Gary M., 3,929,815.

Gulf & Western Industries, Inc.: *See—*
Meier, Carl H., 3,930,142.

Gulick, Ronald A.: *See—*
Sheesley, John M.; and Gulick, Ronald A., 3,929,024.

Gulistan, Bulent, to Deutsch Fastener Corporation. Cabinet latch. 3,929,360, Cl. 292-67.000.

Gunew, Dimiter Stefanoff; and Herniman, Ronald John, to ICI Australia Limited. Method and apparatus for monitoring materials dissolved or suspended in liquid. 3,929,004, Cl. 73-61.10C.

Gunzert, Willi: *See—*
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, 3,929,740.

Gurman, Norman R., to Noray Unlimited, Inc. Multi-magnetic layer teaching aid. 3,928,921, Cl. 35-7.00A.

Gustin, Pol Ambroise Ghislain Joseph: *See—*
Schmidt, Rolf; Carl, Klaus; Gustin, Pol Ambroise Ghislain Joseph; and Schayes, Raymond Georges, 3,930,119.

Guthrie, Larry E., to ACF Industries, Incorporated. Non-floating seat structure for expanding gate valves. 3,929,316, Cl. 251-196.000.

Gutshall, Charles E., to Elco Industries, Inc. Fastening element adapted for tightening to predetermined torque. 3,929,054, Cl. 85-61.000.

Gutzwiller, Ernst: *See—*
Schmid, Wolfgang; Gutzwiller, Ernst; and Meyer, Urs, 3,929,806.

Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, to Hoffman-La Roche Inc. Processes and intermediates for quinine, quinidine, isomers and derivatives thereof. 3,929,795, Cl. 260-284.000.

H. B. Zachry Co.: *See—*
Putnam, Alvin A., 3,929,241.

H. J. Heinz Company: *See—*
Metz, Ferdinand E.; Boyce, Finis O.; and Segmiller, James L., 3,930,030.

Haase, Jan R.: *See—*
Landholm, Richard A.; Haase, Jan R.; and Krutak, James J., Sr., 3,929,760.

Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for adjusting the phase state of a timing signal. 3,930,203, Cl. 328-155.000.

Habig, Kurt; and Baessler, Konrad, to Hoechst Aktiengesellschaft. Reduction of halonitroaromates using sulfited platinum on carbon catalysts. 3,929,891, Cl. 260-580.000.

Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic material containing a sensitizing and stabilizing combination of a polyalkylene oxide, a tetrazaindene and a resorcinol derivative. 3,929,486, Cl. 96-76.00R.

Hackett, David E.; and Keske, Frank E., to Caterpillar Tractor Co. Shaft journal bearing lubrication system. 3,929,394, Cl. 308-121.000.

Hadnagy, Thomas D.: *See—*
Marino, Frank; and Hadnagy, Thomas D., 3,928,886.

Hadni, Armand; and Thomas, Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Ferroelectric memories and method of activating the same. 3,930,240, Cl. 340-173.200.

Hagiwara, Hisami: *See—*
Nakamura, Tadashi; and Hagiwara, Hisami, 3,929,950.

Hahn, Peter A.: *See—*
Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., 3,929,574.

Hahn, William F.; and Graf, Carl R., to Pennsylvania Crusher Corporation. Shredder crusher material reducer. 3,929,293, Cl. 241-42.000.

Hahner, Reinhard: *See—*
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 3,929,876, Cl. 260-544.00L.

Haley, Claude T., to United States of America, General Counsel-Code GP. Clock setter. 3,929,364, Cl. 294-19.00R.

Hall, Claude E.; and Stalvey, Louis L., to Monsanto Company. Binders for printing inks. 3,929,701, Cl. 260-23.0ST.

Hall, Ernest M., Jr., to Walker-Hall-Sears, Inc. Method of making geophones having matched sensitivities. 3,930,216, Cl. 340-5.00C.

Hall, Ernest M., Jr., to Walker-Hall-Sears, Inc. Geophone casings. 3,930,218, Cl. 340-17.000.

Hall, John B.; and Sanders, James Milton, to International Flavors & Fragrances Inc. Perfume compositions and perfurme articles containing one isomer of an octahydrotetramethyl acetonaphthone. 3,929,677, Cl. 252-522.000.

Hall, John B., to International Flavors & Fragrances Inc. 4-Acetyl-2,3-dimethyl-6-isopropenylmethyl-cyclohexene. 3,929,895, Cl. 260-586.00R.

Haller, Walter, to Escher Wyss Limited. Foundry mixing machine. 3,929,320, Cl. 259-165.000.

Hallhagen, Sven Goran: *See—*
Carlsson, Per Arvid Emil; Corredi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, 3,929,871.

Hamblin, Peter Collen: *See—*
Brewster, Phillip William; Hamblin, Peter Collen; and Rutherford, James Pennycook, 3,929,654.

Hamilius, Albert, to Centre de Recherches Metallurgiques— Centrum voor Research in de Metallurgie. Removal of slag from a metallurgical vessel. 3,929,638, Cl. 210-65.000.

Hamilton, Brian K., to Allied Chemical Corporation. Pyrotechnic cool gas generation method for inflatable structure. 3,928,964, Cl. 60-219.000.

Hamm, Philip C.; and Schafer, David E., to Monsanto Company. Herbicidal compositions and methods. 3,929,450, Cl. 71-86.000.

Hammann, Ingeborg: *See—*
Siegle, Peter; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,929,838.

Hammond, John S.: *See—*
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., 3,929,543.

Hamprecht, Gerhard: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,929,454.

Hamza, Hassan A.: *See—*
Visman, Jan; and Hamza, Hassan A., 3,929,633.

Hanawa, Masakazu: *See—*
Abiko, Shiro; Yorihiro, Kazuo; Sugihara, Toshiyuki; and Hanawa, Masakazu, 3,929,618.

Hancock Brick and Tile Company: *See—*
Schmunk, John D.; Child, James L., Jr.; Shroy, Robert E.; and Wise, John, 3,929,359.

Hancock, John Douglas; and Hepworth, Matthew A., to Magnesium Elektron Limited. Sintered zirconia bodies. 3,929,498, Cl. 106-57.000.

Hand, John W., to Mintech Corporation. Process for extracting water and energy from synthesis gas. 3,928,973, Cl. 60-648.000.

Hanna Mining Company, The: *See—*
Kempa, Joseph E., 3,929,647.

Hansch, Ferdinand: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,929,714.

Hansel, Gernot: *See—*
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.

Hanslik, Wilhelm, to Krauss-Maffei Aktiengesellschaft. Multiscrew extruder. 3,929,322, Cl. 259-192.000.

Hansson, Tomas Wilhelm. Combination implement for dental use. 3,928,916, Cl. 32-69.000.

Hara, Isao: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Hara, Satoshi; Akino, Morio; and Nakagawa, Keizo, to Tokyo Shibaura Electric Co., Ltd. Endless tape transporting device. 3,929,298, Cl. 242-55.19R.

Hardwick, Thomas L. Bandage and method of using same. 3,929,131, Cl. 128-254.000.

Hargest, Thomas S. Method for lymphocyte depletion. 3,929,130, Cl. 128-214.00R.

Harmon, Carlyle, to Johnson & Johnson. Apertured nonwoven fabrics. 3,930,086, Cl. 428-131.000.

Harnden, John D., Jr., to General Electric Company. Incandescent lamps having protection against voltage surges. 3,930,183, Cl. 315-71.000.

Harnden, John D., Jr.: *See—*
Kornrumpf, William P.; and Harnden, John D., Jr., 3,930,193.

Harper, Ernest A.; and Bailey, Dunn M., to Phillips Petroleum Company. Refrigeration process. 3,929,438, Cl. 62-9.000.

Harris, John L., to Deltrol Corporation. Program centralled, cam operated switch assembly. 3,930,132, Cl. 200-38.00R.

Harris, Norman E.; Umina, Anthony P.; and Westcott, Donald E., to United States of America, Army. Baking powder of improved stability and method of producing same. 3,930,032, Cl. 426-97.000.

Harris Press & Shear Corporation: *See—*
Thompson, Wallace M., 3,929,062.

Harrison, Henry R.: *See—*
Seni, Leonard S.; Davis, James E.; and Harrison, Henry R., 3,929,652.

Harrison, Robert S.; Medrick, John D.; and Nowroski, Alvin P., to Ford Motor Company. Carburetor cold engine air/fuel mixture enrichment apparatus. 3,929,942, Cl. 261-39.00B.

Hartdegen, Frank J.: *See—*
Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., 3,929,574.

Harte, James Richard. Mathematical balance. 3,928,923, Cl. 35-31.00R.

Hartmann, Friedrich: *See—*
Lundstrom, Goran Ingemar; Hartmann, Friedrich; and Huijsers, Willem, 3,929,276.

Hartz Mountain Corporation, The: *See—*
Suchowski, Bernard; Lovitz, David D.; and Kissin, Claud W., 3,929,102.

Harwell, Kenneth E.: *See—*
Wright, Howard J.; and Harwell, Kenneth E., 3,929,744.

Hasegawa, Yukio: *See—*
Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, 3,929,765.

Hashimoto, Yoshinobu: *See—*
Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, 3,929,903.

Hashizume, Astuo; Tsuzuki, Ryuichiro; and Mizushima, Haruo, to Teijin Limited. Method for fire-proofing treatment of fabrics composed of polyester and cellulosic filaments or fibers. 3,930,079, Cl. 427-396.000.

Hastings, Donald R.; and Noss, Jeffrey S., to Nordson Corporation. Apparatus and method for electrostatically spraying highly electrically conductive water-based coating material. 3,929,286, Cl. 239-3.000.

Hasty, William E. Gravity hot water circulating system and flow regulator therefor. 3,929,153, Cl. 137-337.000.

Hattori, Hirotsugu; and Takayama, Yuichiro, to Matsushita Electronics Corporation. Method of manufacturing high breakdown voltage rectifiers. 3,929,531, Cl. 156-3.000.

Hatwell, Henri: *See—*
Kotval, Peshotan S.; Hatwell, Henri; and Gortsema, Frank P., 3,929,427.

Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Certain tetrahydronaphthalenes used in the treatment of cardiac arrhythmia. 3,930,022, Cl. 424-330.000.

Haugwitz, Rudiger D.: *See—*
Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., 3,929,814.

Hauser, Gerhard: *See—*
Kreeb, Helmut; Hauser, Gerhard; and Kogler, Klaus, 3,929,136.

Hawrylo, Frank Zygmunt, to RCA Corporation. Method of forming ohmic contacts. 3,929,525, Cl. 148-171.000.

Hawthorne, David Geoffrey: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,929,502.

Hayakawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Printing mechanism. 3,929,215, Cl. 197-1.00R.

Hayashi, Koichiro: *See—*
Kaetsu, Isao; Ito, Akihiko; and Hayashi, Koichiro, 3,929,602.

Hayashi, Shigeki: *See—*
Yaeda, Yasuyuki; Hayashi, Shigeki; and Kimura, Kazuo, 3,930,107.

Hayazaki, Tamotsu: *See—*
Kurata, Takeo; Hayazaki, Tamotsu; and Murakami, Kyoko, 3,928,958.

Hayes, Geoffrey, to Toy Development Limited. Board game apparatus. 3,929,337, Cl. 273-134.00C.

Heaphy, Clifford John. Oral hypoglycemic method. 3,929,999, Cl. 424-228.000.

Heatbath Corporation: *See—*
Houlihan, William F., deceased; Newell, Isaac Laird; and La Cosse, Gerald E., 3,929,514.

Heaton, John F.: *See—*
McLeod, Willard W., Jr.; and Heaton, John F., 3,930,238.

Hebert, Donald G., to D & D Associates. Wire matrix ballistic impact print head. 3,929,214, Cl. 197-1.00R.

Hecla Mining Company: *See—*
Cottam, Stephen M.; Day, Howard E.; and Griffith, William A., 3,929,597.

Hedrich, Loren W., to Gulf Oil Corporation. Method of alleviating dermal toxicity of pesticide compositions. 3,929,449, Cl. 71-82.000.

Heidelberger Druckmaschinen AG: *See—*
Jahn, Hans-Georg, 3,929,069.

Heimbach, Paul: *See—*
Wilke, Gunther; and Heimbach, Paul, 3,929,921.
Wilke, Gunther; and Heimbach, Paul, 3,929,922.

Heimdal, Ivar Dagfinn; and Skreosen, Ivar, to Norsk Hydro A.S. Apparatus for portioning liquid metal. 3,929,263, Cl. 222-373.000.

Hein, Hilmar: *See—*
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, 3,929,907.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,929,919.

Held, Gerhard; and Balle, Walter, to Rheinstahl Aktiengesellschaft. Method and drum for building and shaping blanks for radial-ply tires. 3,929,540, Cl. 156-123.000.

Hellmuth, Werner: *See—*
Frenyo, Pal; Bicker, Wilhelm; and Hellmuth, Werner, 3,929,378.

Hellner, Lars Ivar; and Norstrom, Lars-Ake. Corrosion-resistant austenitic-ferritic stainless steel. 3,929,520, Cl. 148-37.000.

Henderson Manufacturing Co.: *See—*
Phillips, Lyle C., 3,929,292.

Hendrich, Richard G. Ladder bearing plate. 3,929,208, Cl. 182-108.000.

Hendrickson, Roger A.: *See—*
Diebolt, Edwin J.; and Hendrickson, Roger A., 3,929,165.

Hendrix, James E.; and Kuhn, Hans H., to Deering Milliken Research Corporation. Defect-detecting method and apparatus. 3,929,013, Cl. 73-160.000.

Hendrix, James E.: *See—*
Farmer, Larry B.; Hendrix, James E.; and Kuhn, Hans H., 3,929,406.

Henningsen Foods, Inc.: *See—*
Warren, William H., 3,929,234.

Henrichon, Ernest G., Jr.; and Bloom, Harvey J., to Xicon Data Entry Corporation. Method and system for optical character recognition. 3,930,231, Cl. 340-146.3MA.

Henry, Dale Vernon: *See—*
Blust, Henry Leo; Lindburg, Norman Lee; and Henry, Dale Vernon, 3,929,426.

Henry, H. Clarke; and Gilbert, John B., to Exxon Research & Engineering Co. Hydrocracking extraction process for lubes. 3,929,617, Cl. 208-96.000.

Hepworth, Matthew A.: *See—*
Hancock, John Douglas; and Hepworth, Matthew A., 3,929,498.

Herkes, Frank Edward, to Du Pont de Nemours, E. I., and Company. N,n′,n″,n‴-tetrasubstituted malonamidines and salts. 3,929,882, Cl. 260-564.00R.

Herman, Elvin E.: *See—*
Keller, Bruce W.; Hoffman, William C.; and Herman, Elvin E., 3,930,120.

Herniman, Ronald John: *See—*
Gunew, Dimiter Stefanoff; and Herniman, Ronald John, 3,929,004.

Hervert, George L., to Universal Oil Products Company. Alkylation of hydroxy-substituted aromatic compounds. 3,929,912, Cl. 260-624.00C.

Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., to Pfizer Inc. Tetrazolyl derivatives of naturally occurring prostaglandins. 3,929,818, Cl. 260-308.00D.

Hess, Irving J., to Ametek, Inc. Electrodepositing of aluminum. 3,929,611, Cl. 204-14.00N.

Hesston Corporation: *See—*
Case, Cecil L., 3,928,955.

Heuring, Vincent Paul: *See—*
Laughlin, Robert Gene; and Heuring, Vincent Paul, 3,929,678.

Heyes, Josef. Method of applying a firmly adherent coating of nonmetallic substances to an electrically conductive substrate. 3,929,590, Cl. 204-16.000.

Hiasa, Toshihisa; and Ishimard, Hirohisa, to Iwao Engineering Co., Inc. Process of removing ammoniacal nitrogen from waste water. 3,929,600, Cl. 204-149.000.

Hibbel, Josef: *See—*
Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, 3,929,900.

Hickey, Christopher Daniel Dowling. Flexible containers. 3,929,178, Cl. 150-52.00K.

Hidohira, Yoshihumi, to Mitsui Mining & Smelting Co., Ltd. Electrolytic cell having means for supporting the electrodes on the cell wall and means for shorting out the electrodes. 3,929,614, Cl. 204-242.000.

Hienuki, Atsushi: *See—*
Sekiya, Tetsuo; and Hienuki, Atsushi, 3,930,186.

Hieronymus, Gerald W.: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.

Higgins, James Francis, to Du Pont de Nemours, E. I., and Company. Chrome yellow pigment with improved thermal stability. 3,929,500, Cl. 106-298.000.
Higuchi, Takeru, to Alza Corporation. Osmotic dispenser. 3,929,132, Cl. 128-260.000.
Higuchi, Takeru; Bodor, Nicolae S.; and Shek, Efraim, to Interx Research Corporation. Novel pro-drug derivatives of pyridinium aldoxime type cholinesterase reactivators and process for preparing same. 3,929,813, Cl. 260-296.00M.
Higuchi, Takeru, to Interx Research Corporation. Pharmaceutical compositions containing a digoxin complex. 3,929,996, Cl. 424-182.000.
Hill, Fredric Martin: *See—*
White, Raymond Hadley; and Hill, Fredric Martin, 3,929,938.
Hill, Nigel: *See—*
Parker, James Eric; and Hill, Nigel, 3,928,981.
Hilty, Donald C.: *See—*
Todd, Lamar S.; Fitzgibbon, Alan; Carosella, Michael C.; and Hilty, Donald C., 3,929,464.
Hindell, Sidney E., to Diagnostic Instruments, Inc. Cassette unit. 3,930,156, Cl. 250-315.00A.
Hinderstein, Philip M.: *See—*
Petroff, Guy, 3,929,362.
Hines, Edwin W., to Kennametal Inc. Indicator device for indicating tread wear and tire incorporating the indicator. 3,929,179, Cl. 152-330.00A.
Hino, Seiichi: *See—*
Inomata, Jihei; Hino, Seiichi; and Tani, Tatsuo, 3,929,914.
Hiramatsu, Yoshio: *See—*
Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, 3,929,765.
Hirayama, Yoshio: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.
Hirokane, Tadashi: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,929,612.
Hirose, Yoshio: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; and Hirose, Yoshio, 3,929,571.
Hiroshi, Miyazakai; Kazuo, Kato; and Michinori, Koyama, to Nippon Kayaku Co., Ltd. Method for the preparation of high purity kallikrein. 3,929,757, Cl. 260-112.50R.
Hirsch, Jean; and Buret, Jean Pierre, to Roussel-UCLAF. Anti-inflammatory glycoprotein compositions and method of use. 3,929,994, Cl. 424-177.000.
Hishinuma, Yukio: *See—*
Tanaka, Hirobumi; Arashi, Norio; Hishinuma, Yukio; and Tamura, Zensuke, 3,929,416.
Hitachi, Ltd.: *See—*
Akahori, Kimihiko; and Era, Masayuki, 3,929,471.
Akahori, Kimihiko; and Era, Masayuki, 3,929,518.
Ichiryu, Ken; Shigeta, Masayuki; Nakamura, Ichiro; and Kajiwara, Toshiyuki, 3,928,994.
Kanomata, Ichiro; Doi, Hiroshi; and Tamura, Hifumi, 3,930,155.
Kudo, Tetsuichi; Gejyo, Tetsuo; Yoshida, Kazuetsu; and Seki, Michiharu, 3,929,670.
Takano, Nobuyoshi; Sakai, Kaoru; Aoki, Satoshi; and Yasuda, Kazuo, 3,929,411.
Tanaka, Hirobumi; Arashi, Norio; Hishinuma, Yukio; and Tamura, Zensuke, 3,929,416.
Yamauti, Teruo; Oyama, Yoshishige; and Hohsho, Yukio, 3,929,115.
Hiyama, Osamu; and Ito, Kazuo, to Kao Soap Co., Ltd. Vinyl chloride type resin composition containing a lubricant. 3,929,712, Cl. 260-31.80B.
Hlavacek, Robert A.: *See—*
Wolf, Harold G., Jr.; and Hlavacek, Robert A., 3,929,928.
Hobbensiefken, Dean W. Vehicle cab configuration effecting reduction of air drag and enhancing storage space capacity and convenience. 3,929,202, Cl. 180-68.00R.
Hochberg, Seymore, to Du Pont de Nemours, E. I., and Company. Film-forming compositions comprising dispersions of cellulose acetate butyrate or polymethylmethacrylate combined with rubbery particles of crosslinked polyacrylates in liquid carrer. 3,929,693, Cl. 260-17.00R.
Hodge, Robin H., to National Semiconductor Corporation. Integrated circuit package utilizing novel heat sink structure. 3,930,114, Cl. 174-52.0FP.
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, to Commonwealth Scientific & Industrial Research Organization. Titanium dioxide pigments and fillers. 3,929,502, Cl. 106-300.000.
Hodil, Elmer R., to Olin Corporation. Powder-actuated tool. 3,929,269, Cl. 227-10.000.
Hoechst Aktiengesellschaft: *See—*
Beermann, Claus; Knittel, Volker; and Dursch, Walter, 3,929,874.
Brandt, Wilhelm; and Bindrum, Irmgard, 3,930,109.
Habig, Kurt; and Baessler, Konrad, 3,929,891.
Papenfuss, Theodor, 3,929,864.
Waldmann, Karl, 3,929,854.
Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 3,929,812.
Hoerner Waldorf Corporation: *See—*
Bowles, Renile E., 3,929,272.
Locke, Frank W.; and Sorenson, John F., 3,929,225.
Swanson, Elmer G., 3,929,273.
Hoet, Roger: *See—*
Gerlach, Pierre; and Hoet, Roger, 3,930,179.
Hoffman, James D.: *See—*
Good, William E.; Di Grasso, Leonard; and Hoffman, James D., 3,928,906.
Hoffman-La Roche Inc.: *See—*
Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, 3,929,795.
Hoffman, Willi, to General Motors Corporation. Radiator mountings for internal combustion engines. 3,929,201, Cl. 180-68.00R.
Hoffman, William C.: *See—*
Keller, Bruce W.; Hoffman, William C.; and Herman, Elvin E., 3,930,120.
Hoffmann, Karl H.; Anderson, Donald R.; and Allain, Ronald J., to Nalco Chemical Company. Method of producing a raney copper catalyst and the catalyst so made. 3,929,673, Cl. 252-463.000.
Hoffmann-La Roche Inc.: *See—*
Fischli, Albert Eduard; Klaus, Michael Josef; Mayer, Hans Johann; and Wick, Alexander Eduard, 3,929,853.
Fothergill, Graham Alwyn; Osbond, John Mervyn; and Wickens, James Charles, 3,929,836.
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,929,791.
Hajos, Zoltan George, 3,929,876.
Leimgruber, Willy; and Weigele, Manfred, 3,929,790.
Metlesics, Werner; and Sternbach, Leo Henryk, 3,929,766.
Hofmann, Dieter Albrecht. Foamed conveyor belt. 3,929,026, Cl. 74-237.000.
Hogan, Gerard T.; and Weik, Kirby B., to Universal Oil Products Company. Vehicle seat with headrest movement responsive to seat back tilting. 3,929,374, Cl. 297-61.000.
Hoglen, Edward L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,929,957.
Hohenschutz, Heinz: *See—*
Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, 3,929,898.
Hohsho, Yukio: *See—*
Yamauti, Teruo; Oyama, Yoshishige; and Hohsho, Yukio, 3,929,115.
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., to Dayco Corporation. Method for producing a continuous flexible reinforced tubular conduit. 3,929,957, Cl. 264-150.000.
Holder, Philippe. Automatically inflating and liberating a balloon. 3,929,091, Cl. 116-124.00B.
Holik, Herbert; and Mueller, Karl, to Escher Wyss G.m.b.H. Continuous process for forming webs from fiber suspensions. 3,929,560, Cl. 162-157.00R.
Holland, Gerald F., to Pfizer Inc. Aryl carboxylic acids. 3,929,803, Cl. 260-293.620.
Hollick, John G.: *See—*
Day, John T.; and Hollick, John G., 3,929,949.
Holly, Harry H., to Hollymatic Corporation. Molding apparatus. 3,928,891, Cl. 17-32.000.
Hollyday, Robert David, to AMP Incorporated. Mounted ceramic filter. 3,930,210, Cl. 333-79.000.
Hollymatic Corporation: *See—*
Holly, Harry H., 3,928,891.
Holmes, Ann; and Meyer, Robert F., to Parke, Davis & Company. 1-(3,4-Dimethoxyphenethylamino)-3-(phenoxy)-2-propanols. 3,929,856, Cl. 260-465.00E.
Honeywell Inc.: *See—*
Dever, John Alden, 3,930,202.
Gore, Jon S.; and Walk, Charles R., 3,929,504.
Stauffer, Norman L., 3,930,261.
Honig, Gunter: *See—*
Ackermann, Fritz; Honig, Gunter; and Schulz, Alfred, 3,930,201.
Honig, Milton L., to Stauffer Chemical Company. Bis(2,3-dibromopropyl)phosphate as a flame retardant for polymers. 3,929,688, Cl. 260-2.5AJ.
Honkanen, Reino Walter. Leak-resistent guage. 3,929,020, Cl. 73-420.000.
Hooker Chemicals & Plastics Corporation: *See—*
Tybus, Axel W.; and Fabrizio, Leonard A., 3,929,700.
Hopkins, Gary L.: *See—*
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., 3,929,382.
Hopkins, Gary Lee: *See—*
Urban, John A.; and Hopkins, Gary Lee, 3,929,383.
Hopkins, Hubert Brian: *See—*
Davies, Thomas Ellis; and Hopkins, Hubert Brian, 3,929,936.
Horizons Incorporated, a division of Horizons Research Incorporated: *See—*
Wainer, Eugene; and Quaintance, Harold J., 3,929,483.
Horn, George M., to United States of America, Navy. Method of assembling a glass spherical segment viewing port to a submarine vessel. 3,929,533, Cl. 156-71.000.
Horne, Frederick H., to Rice Barton Corporation. Humidifier. 3,929,941, Cl. 261-35.000.
Horning, Albert Emerson, to General Electric Company. Silicone pressure sensitive adhesives and tapes. 3,929,704, Cl. 260-29.1SB.

Horowitz, Carl, to Polymer Research Corporation of America. Polymer grafting onto hydrocarbon liquids. 3,929,800, Cl. 260-290.00R.

Hosaka, Hirokazu: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.

Hoskins, David Orville, to Tektronix Inc. Sliding stylus holder for an x-y plotter. 3,930,259, Cl. 346-139.00R.

Hosler, Peter; and Gates, David S., to Sun Research and Development Co. Process for preparation of isomers of 1-cyclohexyl-1,3,3-trimethylhydrindane. 3,929,923, Cl. 260-667.000.

Houlihan, Rosemary, executrix: *See—*
Houlihan, William F., deceased; Newell, Isaac Laird; and La Cosse, Gerald E., 3,929,514.

Houlihan, William F., deceased (by Houlihan, Rosemary, executrix); Newell, Isaac Laird; and La Cosse, Gerald E., to Heatbath Corporation. Composition and method for forming a protective coating on a zinc metal surface. 3,929,514, Cl. 148-6.140.

Howard, James A.; and Kelly, Robert R., to Byron Jackson Inc. System for handling and racking pipe in the hold of a vessel. 3,929,235, Cl. 214-2.500.

Howell, Samuel Garry: *See—*
Miller, Robert W.; and Howell, Samuel Garry, 3,929,702.

Howlitt, Thomas Michael: *See—*
Merton, Harry; and Howlitt, Thomas Michael, 3,929,400.

Howson-Algraphy Limited: *See—*
Smith, Peter John, 3,929,488.

Hsiao, Chih C., to Reagents of the University of Minnesota, The. Inline production control of polymeric film. 3,930,167, Cl. 250-572.000.

Hsu, Ta-Lin; and Hu, Hung Liang, to International Business Machines Corporation. Method and apparatus for stabilizing a bubble domain system. 3,930,243, Cl. 340-174.0TF.

Hsu, Wan-Jean: *See—*
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,037.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,038.

Hu, Hung Liang: *See—*
Hsu, Ta-Lin; and Hu, Hung Liang, 3,930,243.

Huch, Albert: *See—*
Lubbers, Dietrich W.; and Huch, Albert, 3,929,605.

Hudson, Alan George; and Orpwood, John Leonard, to Coates Brothers & Company Limited. Polymerizable polymer compositions. 3,929,698, Cl. 260-22.0CB.

Huerta, James R.; Anderson, Amos R.; and Meyer, Jeffrey G., to Dart Industries Inc. Vanadium organophosphates. 3,929,745, Cl. 260-80.780.

Hughes Aircraft Company: *See—*
Keller, Bruce W.; Hoffman, William C.; and Herman, Elvin E., 3,930,120.

Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, to Armour Pharmaceutical Company. Cyclization of cysteine-containing peptides. 3,929,758, Cl. 260-112.50R.

Hugin Kassaregister AB: *See—*
Lundstrom, Goran Ingemar; Hartmann, Friedrich; and Huijsers, Willem, 3,929,276.

Huijsers, Willem: *See—*
Lundstrom, Goran Ingemar; Hartmann, Friedrich; and Huijsers, Willem, 3,929,276.

Hull, David C.: *See—*
McCollum, Anthony W.; and Hull, David C., 3,929,867.

Hulse, George E.; and Kersting, R. James, to ARCO Polymers, Inc. Poly(p-benzenesulfonamide). 3,929,742, Cl. 260-79.30R.

Hunt, James P.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hogfen, Edward L.; and Kleykamp, Donald L., 3,929,957.

Hunt, Joe B.; and Hunt, Nina E. Fluorescent tube changing device. 3,929,365, Cl. 294-21.000.

Hunt, Nina E.: *See—*
Hunt, Joe B.; and Hunt, Nina E., 3,929,365.

Hunter, Willard L.: *See—*
Tress, Jack E.; and Hunter, Willard L., 3,929,459.

Hurd, Gordon, to Avco Corporation. Open screen smoke detector and circuit. 3,930,247, Cl. 340-237.00S.

Hurley, Joseph John, to J & P Coats Limited. Pulley wheels. 3,929,302, Cl. 242-155.00R.

Hurner, Edwin E. Vibration resistant heat exchanger for internal combustion engines. 3,929,187, Cl. 165-52.000.

Hurtig, Gunnar, III: *See—*
Warren, George H.; and Hurtig, Gunnar, III, 3,930,127.

Hynes, John T.; and Vakaleris, Demetrius G., to Kraftco Corporation. Preparation of a low fat cream cheese product. 3,929,892, Cl. 426-582.000.

Ichiryu, Ken; Shigeta, Masayuki; Nakamura, Ichiro; and Kajiwara, Toshiyuki, to Hitachi, Ltd. Thickness control system for a rolling mill. 3,928,994, Cl. 72-8.000.

ICI Australia Limited: *See—*
Gunew, Dimiter Stefanoff; and Herniman, Ronald John, 3,929,004.
Serban, Alexander; and Engel, Phillip Knox, 3,929,837.

ICI United States Inc.: *See—*
Baldino, James P.; and Feltzin, Joseph, 3,929,866.
Kuehn, Erich, 3,929,929.

Ide, Yadenji: *See—*
Mihara, Hiromichi; Yajima, Yuzuru; and Ide, Yadenji, 3,930,106.

Idel, Vladimir Viktorovich. Band-saw sharpening machine. 3,929,040, Cl. 76-37.000.

Igenbergs, Eduard B.: *See—*
United States of America, National Aeronautics and Space Administration; Shriver, Edward L.; and Igenbergs, Eduard B., 3,929,119.

Iizuka, Shimpei; and Ishimoto, Katsumi, to Sumitomo Shipbuilding & Machinery Co., Ltd. Method and apparatus for fillett welding longitudinal members of framed structures. 3,930,137, Cl. 219-125.00R.

Ikeda, Hisao, to Matsushita Electric Industrial Co., Ltd. Channel indicating device for television receiving sets. 3,929,093, Cl. 116-124.20R.

Iliev, Iliya Marinov: *See—*
Petrov, Georgi Mitov; Iliev, Iliya Marinov; and Ilov, Rangel Georgiev, 3,928,957.

Illinois Tool Works Inc.: *See—*
Bury, George John; and Swick, Edwin Grant, 3,928,894.
Edwards, Bryant, 3,929,952.

Ilov, Rangel Georgiev: *See—*
Petrov, Georgi Mitov; Iliev, Iliya Marinov; and Ilov, Rangel Georgiev, 3,928,957.

Imada, Seiya: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.

Imperial Chemical Industries Limited: *See—*
Aldridge, David Cecil; Borrow, Antony; and Gerring, Ernest Edward Lawrence, 3,930,014.
Atherton, John Heathcote; Plumb, John Beckett; and Stuart, Ronald Sangster, 3,929,851.
Austin, Peter William, 3,929,771.
Barlow, Charles Brian; and Tomlin, Clive Dudley Spencer, 3,930,007.
Gregson, Leslie, 3,930,099.
Krause, Janusz Josef Henryk, 3,929,607.
Morris, Cyril; and Topham, Arthur, 3,929,405.
Nield, Eric, 3,929,710.
Parry, David Rees, 3,929,789.

Inamoto, Yoshiaki: *See—*
Nakagawa, Yunosuke; Inamoto, Yoshiaki; and Aigami, Koji, 3,929,661.

Inazuka, Shinichi; and Ninagawa, Sadayoshi, to Ajinomoto Co., Inc. Urocanic acid amide derivatives. 3,929,819, Cl. 260-309.000.

Industrie Pirelli S.p.A.: *See—*
Pasini, Franco, 3,930,112.

Ingenieurburo fur Maschinebau Jakob Muller: *See—*
Muller, Jakob, 3,929,170.

Ingersoll, Clyde E., to Williams Gold Refining Company Incorporated. Tarnish resistant silver based dental casting alloy capable of bonding to porcelain. 3,929,474, Cl. 75-172.00G.

Ingersoll, Clyde E., to Williams Gold Refining Company Incorporated. Tarnish resistant silver based dental casting alloy having superior improved ductility and work hardening characteristics. 3,929,475, Cl. 75-173.00R.

Inomata, Jihei; Hino, Seiichi; and Tani, Tatsuo, to Mitsubishi Chemical Industries, Ltd. Process for preparing a polycarboxydiene polymer. 3,929,914, Cl. 260-635.00E.

Inoue, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Device for setting the inclination of the bucket in a bulldozer. 3,929,245, Cl. 214-764.000.

Institut Fiziki Akademii Nauk Latviiskoi SSR: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorcfeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.

Institutes of Medical Sciences, The: *See—*
Barnes, Clarence W.; and Shore, Jack H., 3,929,125

Inter-Polymer Research Corporation: *See—*
Graefe, Peter U.; Gajewski, Vincent J.; and Jimenez, Ismael A., 3,979,730.

Intercontinental Trading Company - Intraco: *See—*
Devillers, Julien Albert, 3,928,945.

International Business Machines Corporation: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.
Guarnieri, C. Richard; Lee, Kenneth; and Onton, Aare, 3,930,241.
Hsu, Ta-Lin; and Hu, Hung Liang, 3,930,243.
Knappe, LaVerne Frank; Sapetta, Lee Philip; Stroebel, Gary John; and Wilke, Myron Arden, 3,929,328.
Pfeiffer, Hans Christian, 3,930,181.
Poponiak, Michael R., 3,929,529.
Voegeli, Otto, 3,930,244.

International Flavors & Fragrances Inc.: *See—*
Chappell, Robert L.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred H., 3,929,676.
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,929,919.
Hall, John B.; and Sanders, James Milton, 3,929,677.
Hall, John B., 3,929,895.
Lemberg, Seymour, 3,929,675.

International Nickel Company, Inc., The: *See—*
Davies, Peter Wesley; and Dennison, John Philip, 3,929,467.

International Pregnancy Advisory Services: *See—*
Ragab, Mohamed Ismail, 3,929,133.

International Shoe Machine Corporation: *See*—
Runions, Sinville, 3,928,880.
International Standard Electric Corporation: *See*—
Kobus, Stanislas; Janssens, Juliaan Leo Gerard; and Zoile, Willy Charles Jacques, 3,930,235.
Mathiesen, Odd, 3,930,121.
International Telephone and Telegraph Corporation: *See*—
Carroll, Gordon S., 3,930,123.
Green, John Hugh, 3,930,126.
Interx Research Corporation: *See*—
Higuchi, Takeru; Bodor, Nicolae S.; and Shek, Efraim, 3,929,813.
Higuchi, Takeru, 3,929,996.
Intreprinderea "Bucuresti" Pentru Extragerea, Prelucrarea si Montarea Marmurei si Pietrei de Constructii: *See*—
Constantin, Gurgui N.; Luca, Vasile; Eckardt, Andras; and Ciulacu, Paraschiv I., 3,930,088.
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorofeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, to Institut Fiziki Akademii Nauk Latviiskoi SSR. Method of orienting electrically conductive bodies, preferably non-magnetic ones, in a magnetic field and apparatus for performing same. 3,930,212, Cl. 335-284.000.
Ippolito, Madeline: *See*—
Montalbano, Anthony P., 3,929,295.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., to Westinghouse Electric Corporation. Tl_3PSe_4 compound, single crystals. 3,929,970, Cl. 423-299.000.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., to Westinghouse Electric Corporation. Tl_3VS_4 and Tl_3NbS_4 crystals and acousto-optical devices. 3,929,976, Cl. 423-511.000.
Isard, Arsene; and Parvi, Ludovic, to Products Chimiques Ugine Kuhlmann. Quaternary ammonia salts of polyhalogenated aromatic compounds. 3,929,886, Cl. 260-567.60P.
Ishigami, Noriakira Chiryu, to Aisin Seiki Kabushiki Kaisha. Monitoring device for hydraulic brake system. 3,930,222, Cl. 340-52.00C.
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, to Wisconsin Alumni Research Foundation. Process for preparation of steroid derivative. 3,929,770, Cl. 260-239.550.
Ishimard, Hirohisa: *See*—
Hiasa, Toshihisa; and Ishimard, Hirohisa, 3,929,600.
Ishimoto, Katsumi: *See*—
Iizuka, Shimpei; and Ishimoto, Katsumi, 3,930,137.
Isnardi, Luis L., Jr. Means for rejuvenating tennis balls and the like. 3,929,174, Cl. 141-329.000.
Istituto Luso Farmaco d'Italia S.r.l.: *See*—
Manghisi, Elso; and Cascio, Giuseppe, 3,930,008.
Ito, Akihiko: *See*—
Kaetsu, Isao; Ito, Akihiko; and Hayashi, Koichiro, 3,929,602.
Ito, Kazuo: *See*—
Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, 3,929,728.
Hiyama, Osamu; and Ito, Kazuo, 3,929,712.
Itoh, Iko; Sekihara, Takeshi; and Emura, Tomoyuki, to Sumitomo Chemical Company, Limited. Method for producing high bulk density polyvinyl chloride. 3,929,753, Cl. 260-92.80W.
Ivaschenko, Pavel Andreevich: *See*—
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; Judin, Alexandr Nikolaevich; Pisarev, Georgy Lvovich; and Roslyakov, Vladimir Yakovlevich, 3,929,110.
Iwamoto, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Electrical circuit having a pair of thyristors. 3,930,195, Cl. 321-45.00C.
Iwamoto, Takeji. Holding toy. 3,928,933, Cl. 46-119.000.
Iwao Engineering Co., Inc.: *See*—
Hiasa, Toshihisa; and Ishimard, Hirohisa, 3,929,600.
Iwatsu Electric Co., Ltd.: *See*—
Tanaka, Katsuaki, 3,930,144.
Izawa, Shinichi; Ozeki, Juro; Tanaka, Tsutomu; and Nakanishi, Atsuo, to Asahi-Dow Limited. Graft copolymerizing a styrene type compound and a polyphenylene ether. 3,929,930, Cl. 260-874.000.
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, to Asahi-Dow Limited. Graft copolymer of styrene type compound and a polyphenylene ether. 3,929,931, Cl. 260-874.000.
J. I. Case Company: *See*—
Shumaker, John Frederick, 3,929,239.
J. M. Ney Company, The: *See*—
Schaffer, Stephen P., 3,928,913.
J. M. Voith GmbH: *See*—
Csordas, Elemer; Gaugenmaier, Karl; and Kotitschke, Gerhard, 3,929,065.
J & P Coats Limited: *See*—
Hurley, Joseph John, 3,929,302.
Jackson, Arthur Frederick: *See*—
Wookey, Norman; Jackson, Arthur Frederick; Collins, Michael Clive; and Francis, Brian, 3,930,048.
Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread supply device for textile machines. 3,928,987, Cl. 66-132.00R.
Jade Controls, Inc.: *See*—
Solomon, Ralph E., 3,929,511.
Jaegtnes, Karl O.: *See*—
Braytenbah, Andrew S.; Jaegtnes, Karl O.; and Smith, Millard F., 3,928,976.
Braytenbah, Andrew S.; and Jaegtnes, Karl O., 3,928,977.
Jahn, Hans-Georg, to Heidelberger Druckmaschinen AG. Gripper control for sheet-fed rotary printing presses. 3,929,069, Cl. 101-232.000.
Jahngen, Edwin G., Jr.: *See*—
Bader, Henry; and Jahngen, Edwin G., Jr., 3,929,848.
Jakobsen, Karl Severin; and Nadeau, Victor Joseph, to United Technologies Corporation. Process for wet winding filaments. 3,929,956, Cl. 264-137.000.
Jalke, Hellmut Georg: *See*—
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, 3,929,740.
James, John William: *See*—
Wiggins, Leslie Frederick; James, John William; and Gittos, Maurice Ward, 3,930,006.
Jamshidi, Khosrow. Muscle biopsy needle. 3,929,123, Cl. 128-2.00B.
Jansen, Malcolm L.: *See*—
Stern, William R.; Jansen, Malcolm L.; and Vance, Bess L., 3,929,598.
Janssen, Paul Adriaan Jan; van Wijngaarden, Ineke; and Soudijn, Willem, to Janssen Pharmaceutica N.V. 2-Benzimidazolinones. 3,929,801, Cl. 260-293.600.
Janssen Pharmaceutica N.V.: *See*—
Janssen, Paul Adriaan Jan; van Wijngaarden, Ineke; and Soudijn, Willem, 3,929,801.
Janssens, Juliaan Leo Gerard: *See*—
Kobus, Stanislas; Janssens, Juliaan Leo Gerard; and Zoile, Willy Charles Jacques, 3,930,235.
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Halogenation of phenolic compounds. 3,929,907, Cl. 260-619.00R.
Japan Atomic Energy Research Institute: *See*—
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.
Kaetsu, Isao; Ito, Akihiko; and Hayashi, Koichiro, 3,929,602.
Japan Synthetic Rubber Company Limited: *See*—
Yaeda, Yasuyuki; Hayashi, Shigeki; and Kimura, Kazuo, 3,930,107.
Japikse, Cornelis Hendrikus; Singh, Gyanendra; and Kennedy, Timothy J., to Procter & Gamble Company, The. Rapidly dissolving dry beverage mix. 3,930,053, Cl. 426-590.000.
Jarrett, Noel: *See*—
King, Larry K.; and Jarrett, Noel, 3,929,975.
Jayne, Gerald John Joseph: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; and Askew, Herbert Frank, 3,929,653.
Jeumont-Schneider: *See*—
Picandet, Jean A., 3,930,125.
Jewett, Warren R.: *See*—
Abbate, John; Jewett, Warren R.; and Mason, William H., 3,929,250.
Jimenez, Ismael A.: *See*—
Graefe, Peter U.; Gajewski, Vincent J.; and Jimenez, Ismael A., 3,929,730.
Johansen, Inge; and Tong, David W., to Massachusetts Institute of Technology. High voltage overhead transmission line conductor with reduced wet weather corona noise and corona losses. 3,930,113, Cl. 174-40.00R.
John Edwards & Associates, Inc.: *See*—
Edwards, John M.; and Wright, James D., 3,928,939.
John Kirkegaard Maskinfabrik A/S: *See*—
Kirkegaard, John Kirk, 3,929,028.
John O. Butler Company: *See*—
Tarrson, E. B.; and Young, R., 3,929,144.
Johnson, Albert F. Leg support device for skiing. 3,928,872, Cl. 2-22.000.
Johnson & Johnson: *See*—
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., 3,930,090.
Drelich, Arthur H.; and Lukacs, George J., 3,930,073.
Drelich, Arthur H.; and Lukacs, George J., 3,930,074.
Harmon, Carlyle, 3,930,086.
Johnson, Morris A.; and Yang, Kang, to Continental Oil Company. Process for removing iron from an aqueous acid solution containing iron and copper. 3,929,599, Cl. 204-108.000.
Johnsson, Erik Borje, to Aktiebolaget Atomenergt. Method of arranging a seal between a pressure vessel, preferably a reactor vessel, and its lid by means of a torrid ring provided with flanges. 3,929,253, Cl. 220-320.000.
Johren, Paul: *See*—
Morsbach, Martin; Johren, Paul; and Meuken, Hermann, 3,929,342.
Jokay, Louis, to G. D. Searle & Co. High calorie pudding. 3,930,057, Cl. 426-577.000.
Jones, Cecil R.; Yoli, Alfred H.; and Kirk, William F., to Transfer Systems Incorporated. Failed fuel detection for PWR. 3,929,570, Cl. 176-80.000.
Jones, Lewis O., to Xerox Corporation. Stoichiometric ferrite carriers. 3,929,657, Cl. 252-62.10P.
Jones, Stanley C., to Marathon Oil Company. Determination of oil saturation in an anisotropic reservoir. 3,929,011, Cl. 73-155.000.
Jones, Sterling B. Fastening device. 3,928,904, Cl. 29-436.000.
Jos. Schlitz Brewing Company: *See*—
Risley, Robert F., 3,929,218.

Jouhaneau, Monique: *See—*
Bernier, Cecile; Jouhaneau, Monique; and Poisson, Pierre, 3,929,734.

Jounen, Joseph C.: *See—*
Thurston, Franklin J.; Schendeler, Franciscus J.; and Jounen, Joseph C., 3,929,217.

Joye, N. Mason, Jr.: *See—*
Severson, Ray F.; Schuller, Walter H.; Joye, N. Mason, Jr.; and Lawrence, Ray V., 3,929,755.

Judin, Alexandr Nikolaevich: *See—*
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; Judin, Alexandr Nikolaevich; Pisarev, Georgy Lvovich; and Roslyakov, Vladimir Yakovlevich, 3,929,110.

Juhlin, Sven-Eric: *See—*
Bjurling, Per Olof; and Juhlin, Sven-Eric, 3,929,367.

Juiles, Donald R.: *See—*
Fort, J. Robert; Westphal, James A.; Dix, C. Hewitt; and Juiles, Donald R., 3,930,145.

Jung, Bruno. Process for producing casting molds suitable for use in the ceramic industry. 3,929,685, Cl. 260-2.5HB.

Junggren, Ulf Krister: *See—*
Carlsson, Per Arvid Emil; Corrodi, Hans Rudolf; Hallhagen, Sven Goran; and Junggren, Ulf Krister, 3,929,871.

Jurisch, Louis A., to Commercial Solvents Corporation. Emulsion polymerization process employing an oxazoline as chain transfer agent. 3,929,748, Cl. 260-88.10P.

Just, Franz-Peter, to Grafelmann, Hans. Method for manufacturing of a detachable joint for artificial teeth, and a structural member assembly therefor. 3,928,912, Cl. 32-5.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Inoue, Kazuo, 3,929,245.

Kabushiki Kaisha Ricoh: *See—*
Kawazu, Motoaki, 3,929,397.

Kabushiki Kaisha Seikosha: *See—*
Naito, Okito, 3,928,959.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,930,060.

Kabushikikaisha Kawaidenkiseisakusho: *See—*
Saku, Isamu, 3,928,909.

Kadokura, Kenzi: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.

Kaetsu, Isao; Ito, Akihiko; and Hayashi, Koichiro, to Japan Atomic Energy Research Institute. Low temperature irradiation of vitrifiable mixtures of unsaturated monomers. 3,929,602, Cl. 204-159.220.

Kahan, Edward. Portable collector apparatus with resilient tongs. 3,929,363, Cl. 294-19.00R.

Kahn, Leonard R. Method for preparing a pudding. 3,930,051, Cl. 426-573.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Borup, Herbert H., 3,929,247.

Kaiser Glass Fiber Corporation: *See—*
Lewis, Albert; and Krueger, Ronald G., 3,930,091.

Kajiwara, Toshiyuki: *See—*
Ichiryu, Ken; Shigeta, Masayuki; Nakamura, Ichiro; and Kajiwara, Toshiyuki, 3,928,994.

Kakuta, Izumi: *See—*
Komatsu, Yoshihiro; Kakuta, Izumi; and Yamaguchi, Kanemichi, 3,930,041.

Kalafus, Edward F.: *See—*
van Gils, Gerard E.; and Kalafus, Edward F., 3,930,095.

Kali-Chemie Aktiengesellschaft: *See—*
Kuhrt, Winfried; Derleth, Helmut; and Fischer, Hermann, 3,929,682.

Kalnin, Robert Karlovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorcfeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.

Kalogeropoulos, Alexis: *See—*
Tsagas, Nicolas Fotios, 3,930,223.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. Process for producing indoanilines and keratin fiber dye composition containing the same. 3,929,403, Cl. 8-10.100.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe Anonyme dite: L'Oreal. Indoanilines in keratinic fiber dye compositions. 3,929,404, Cl. 8-10.100.

Kalust, Pierre M. Audio visual memorial. 3,928,928, Cl. 40-28.100.

Kalvoda, Jaroslav: *See—*
Anner, Georg; and Kalvoda, Jaroslav, 3,929,844.

Kamatics Corporation: *See—*
Orkin, Stanley S.; and Nagy, Edward John, 3,929,396.

Kamihigoshi, Tutomu: *See—*
Komo, Tetsuya; Mizobata, Satoshi; Ukaji, Rokuo; and Kamihigoshi, Tutomu, 3,929,920.
Wada, Hiroyuki; Kawakami, Yasumasa; and Kamihigoshi, Tutomu, 3,929,415.

Kampe, Wolfgang: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, 3,929,763.
Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, 3,929,764.
Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, 3,929,793.

Kanamori, Hirosuke: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Kanda, Masao; and Suefuji, Mineo, to Fuji Photo Film Co., Ltd. Apparatus for coating a web. 3,929,097, Cl. 118-62.000.

Kaneda, Kazuyoshi: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Mihara, Hiromichi; Yajima, Yuzuru; and Ide, Yadenji, 3,930,106.

Kaneko, Chikara: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.

Kaneko, Takashi: *See—*
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.

Kanomata, Ichiro; Doi, Hiroshi; and Tamura, Hifumi, to Hitachi, Ltd. Ion microprobe analyser. 3,930,155, Cl. 250-309.000.

Kanzaki Paper Manufacturing Company, Ltd.: *See—*
Tanimoto, Tadashi; and Shibata, Kazuo, 3,930,080.

Kanzaki, Toshihiko; Fukita, Tadazumi; and Kono, Yoichiro, to Takeda Chemical Industries, Ltd. Production of cephalosporin C. 3,929,577, Cl. 195-36.00R.

Kao Soap Co., Ltd.: *See—*
Arai, Haruhiko; and Minegishi, Yutaka, 3,929,663.
Arai, Haruhiko; Tachibana, Kyozaburo; Naganuma, Yoshinori; and Murata, Moriyasu, 3,929,680.
Hiyama, Osamu; and Ito, Kazuo, 3,929,712.
Nakagawa, Yunosuke; Inamoto, Yoshiaki; and Aigami, Koji, 3,929,661.

Kaplan, Jean-Pierre: *See—*
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,929,791.

Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article and method. 3,929,134, Cl. 128-284.000.

Kardon, Samuel; and Curry, Carlton J., to United States of America, Navy. Plug for plug nozzles. 3,929,289, Cl. 239-265.110.

Karmin, Irving. Pattern training apparatus. 3,929,462, Cl. 35-37.000.

Kasahara, Yuko: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Katagiri, Yoshiaki; Urayama, Takao; and Mori, Masaji, to Bridgestone Tire Company Limited; and Mori Ironworks Company Limited. Collapsible tire building drum. 3,929,546, Cl. 156-417.000.

Kates, Richard. Metal chair. 3,929,376, Cl. 297-445.000.

Kato, Yozo: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,929,881.

Katz, Leonhard: *See—*
Robinson, Alfred; Schatz, Joseph S.; and Katz, Leonhard, 3,930,165.

Katz, Louis N. Filtration and circulation system and apparatus therefore. 3,929,101, Cl. 119-5.000.

Kaufmann, Heinz; and Wettstein, Albert, to Ciba-Geigy Corporation. Process for the manufacture of steroid epoxides. 3,929,769, Cl. 260-239.55R.

Kaugars, Girts, to Upjohn Company, The. Compositions and methods of combatting arthropodal pests using phenylhydrazone derivatives. 3,930,020, Cl. 424-327.000.

Kaugars, Girts, to Upjohn Company, The. Compositions and methods of combatting arthropodal pests using phenylhydrozone derivatives. 3,930,021, Cl. 424-327.000.

Kawakami, Yasumasa: *See—*
Wada, Hiroyuki; Kawakami, Yasumasa; and Kamihigoshi, Tutomu, 3,929,415.

Kawase, Koichi; and Suzuki, Yasuhide, to Diesel Kiki Kabushiki Kaisha. Fuel injection pump. 3,929,113, Cl. 123-139.00R.

Kawase, Shoji; Maeda, Kenji; Kumakawa, Shiro; and Kuratsuji, Takatoshi, to Teijin Limited. Tyres. 3,929,180, Cl. 152-359.000.

Kawashima, Masao: *See—*
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.

Kawashima, Yuzo. Method for treating diabetic ketoacidosis. 3,929,995, Cl. 424-178.000.

Kawata, Shigeo: *See—*
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,929,579.

Kawazu, Motoaki, to Kabushiki Kaisha Ricoh. Projection lens. 3,929,397, Cl. 350-216.000.

Kay, Charles. Method of making a unitary partition by fusing a connector plate panels. 3,929,534, Cl. 156-73.500.

Kazuo, Kato: *See—*
Hiroshi, Miyazakai; Kazuo, Kato; and Michinori, Koyama, 3,929,757.

Kealy, Richard D., to Ralston Purina Company. Synergistic flavor enhancing coatings for cat food compositions comprising citric and phosphoric acids. 3,930,031, Cl. 426-89.000.

Kedrinsky, Vasily Nikolaevich; and Zakharov, Ivan Dmitrievich. Straight bevel gear grinding machine. 3,928,944, Cl. 51-33.00W.
Keene, Derek K.; and Wahl, James A., to Eaton Corporation. Steering axle assembly providing improved lateral stability. 3,929,346, Cl. 280-87.00R.
Kehm, Paul H., to Teleflex Incorporated. Transmission assembly. 3,929,032, Cl. 74-501.00R.
Keith, Charles H.: *See—*
Levers, William E.; and Keith, Charles H., 3,930,077.
Keith, Roger H., to Minnesota Mining and Manufacturing Company. Film-surface welding backup tape. 3,929,270, Cl. 228-50.000.
Kelbel, Donald W., to Borg-Warner Corporation. Transmission shift control linkage. 3,929,029, Cl. 74-473.00R.
Keller, Bruce W.; Hoffman, William C.; and Herman, Elvin E., to Hughes Aircraft Company. Multi-beam cathode ray tube having equalized line brightness. 3,930,120, Cl. 178-7.700.
Keller, Michael I. Impact sensing detector. 3,930,248, Cl. 340-267.00R.
Kelley, Philip C.: *See—*
Schollenberger, Charles S.; Dinbergs, Kornelius; and Kelley, Philip C., 3,929,726.
Kellner, Maximilian. Method and apparatus for culturing microorganisms. 3,929,582, Cl. 195-107.000.
Kelly, Gilbert H.: *See—*
Bedenbender, John W.; and Kelly, Gilbert H., 3,929,206.
Kelly, Robert R.: *See—*
Howard, James A.; and Kelly, Robert R., 3,929,235.
Kelly, Vincent J.; Cloud, Larry L.; and Smalligan, Wayne J., to Gerber Products Company. Process for preparing a precooked dehydrated product. 3,930,027, Cl. 426-28.000.
Kelsey-Hayes Company: *See—*
Good, William E.; Di Grasso, Leonard; and Hoffman, James D., 3,928,906.
Kelsey, Robert H.: *See—*
Bro, Per; Kelsey, Robert H.; and Marincic, Nikola, 3,929,507.
Kemp, John Edward Glyn: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,930,004.
Kempa, Joseph E., to Hanna Mining Company, The. Screening apparatus. 3,929,647, Cl. 209-395.000.
Kendall Company, The: *See—*
Villari, Frank K., 3,929,412.
Kennametal Inc.: *See—*
Hines, Edwin W., 3,929,179.
Kennecott Copper Corporation: *See—*
Wang, Chih-Chung, 3,929,610.
Kennedy, Timothy J.: *See—*
Japikse, Cornelis Hendrikus; Singh, Gyanendra; and Kennedy, Timothy J., 3,930,053.
Kersting, R. James: *See—*
Hulse, George E.; and Kersting, R. James, 3,929,742.
Keske, Frank E.: *See—*
Hackett, David E.; and Keske, Frank E., 3,929,394.
Ketterer, Stanley Joseph, to Singer Company, The. Electro mechanical adder mechanism. 3,929,081, Cl. 112-158.00D.
Keverline, John J. Cotton loader. 3,929,366, Cl. 294-88.000.
Kewanee Oil Company: *See—*
Swinehart, Carl F., 3,930,160.
Keystone International, Inc.: *See—*
Smith, Joling P., 3,929,058.
Khalid, Joseph M., to Square D Company. Arc-extinguishing materials. 3,929,660, Cl. 252-63.200.
Khan, Ausat Ali: *See—*
Cooper, Terence Alfred; and Khan, Ausat Ali, 3,929,752.
Kibby, Robert M., to Reynolds Metals Company. Carbothermic production of aluminum. 3,929,456, Cl. 75-10.00R.
Kidd, Donald A. Cards, magnetic mounting members and rotatable holder. 3,929,332, Cl. 273-1.00M.
Kiezebrink, Willem, to Wavin B.V. Device for manufacturing fibre reinforced plastic tubes. 3,929,554, Cl. 156-425.000.
Kikuya, Satoshi: *See—*
Tanigawa, Shizuhiko; Kikuya, Satoshi; Yamazoe, Yoshinori; and Nakamura, Chihiro, 3,930,270.
Kilbourn, Edward E.; and Weiler, Ernest D., to Rohm & Haas Company. Pyridyl phenyl-carbamate rodenticide. 3,929,808, Cl. 260-294.80G.
Kim, Gwan; and Ernest, Michael Vance, to W. R. Grace & Co. Dual purpose auto exhaust catalysts. 3,929,965, Cl. 423-213.500.
Kim, Jung K. Key holding device. 3,929,266, Cl. 224-26.00R.
Kim, Kenneth; and Suzuki, Shigemutsu, to Lotte Co., Ltd. Rotary electrostatic precipitator. 3,929,436, Cl. 55-121.000.
Kimura, Ichiro; Sugiyama, Hironari; Takita, Kiyoshi; and Mizutani, Makoto, to Kumiai Chemical Industry. Herbicidal composition. 3,929,452, Cl. 71-100.000.
Kimura, Kazuo: *See—*
Yaeda, Yasuyuki; Hayashi, Shigeki; and Kimura, Kazuo, 3,930,107.
Kimura, Noboru, to VRC California, Inc. High density magnetic storage system. 3,930,265, Cl. 360-45.000.
Kimura, Tsurugi: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.
King, George W.: *See—*
Salava, Roger F.; Eastman, Brian G.; and King, George W., 3,930,251.
King, John M.; and Bakker, Nicolaas, to Chevron Research Company. Extreme pressure agent and its preparation. 3,929,650, Cl. 252-33.400.
King, Larry K.; and Jarrett, Noel, to Aluminum Company of America. Selective recycle production of aluminum chloride. 3,929,975, Cl. 423-496.000.
Kinoshi, Masao; and Furumura, Kyozarburo, to Nippon Steel Corporation. Steel suitable for use as rolling elements. 3,929,523, Cl. 148-143.000.
Kinstle, James F., to Ford Motor Company. Electron beam curable coating composition. 3,929,935, Cl. 260-885.000.
Kirby, Russell B., Jr.; and Wing, Stephen C., to Minnesota Mining and Manufacturing Company. Precision molded refractory articles and method of making. 3,929,476, Cl. 75-214.000.
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of oxocarboxylic acid amides and oxocarboxylic acids. 3,929,880, Cl. 260-559.00A.
Kirk, William F.: *See—*
Jones, Cecil R.; Yoli, Alfred H.; and Kirk, William F., 3,929,570.
Kirkegaard, John Kirk, to John Kirkegaard Maskinfabrik A/S. Gearwheel. 3,929,028, Cl. 74-448.000.
Kirsch, Alan L.: *See—*
Beane, Theodore E.; and Kirsch, Alan L., 3,929,075.
Kissin, Claud W.: *See—*
Suchowski, Bernard; Lovitz, David D.; and Kissin, Claud W., 3,929,102.
Kitagawa, Yoshihiko: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 3,929,747.
Kitamoto, Tatsuji: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, 3,929,604.
Kittaka, Hirokazu: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.
Kittl, Emil, to United States of America, Army. Solar radiation conversion system. 3,929,510, Cl. 136-206.000.
Klaus, Michael Josef: *See—*
Fischli, Albert Eduard; Klaus, Michael Josef; Mayer, Hans Johann; and Wick, Alexander Eduard, 3,929,853.
Klebba, Horst, to Volkswagenwerk Aktiengesellschaft. Lock mechanism for a vehicle door. 3,929,361, Cl. 292-216.000.
Kleimann, Helmut: *See—*
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 3,929,863.
Kleykamp, Donald L.: *See—*
Holden, Homer N.; Hunt, James P.; Browning, Vernon D.; Hoglen, Edward L.; and Kleykamp, Donald L., 3,929,957.
Klimaszewski, Charles Stanley, Jr., to Du Pont de Nemours, E. I., and Company. Process for sealing thermoplastic tube. 3,929,943, Cl. 264-25.000.
Kliment, Karel. Method for providing dentures with a soft hydrogel layer. 3,930,076, Cl. 427-353.000.
Klingenmaier, Otto J., to General Motors Corporation. Plating apparatus and method for rotary engine housings. 3,929,592, Cl. 204-26.000.
Klink, Wolf-Dieter, to Repa Feinstanzwerk GmbH. Adjustable strap fastener. 3,928,895, Cl. 24-196.000.
Kloot, Leslie John, to Cape Air Conditioning (Proprietary) Ltd. Terminal air outlet device. 3,929,280, Cl. 236-1.00B.
Klopping, Hein Louis, to Du Pont de Nemours, E. I., and Company. Fungicidal formulations of 2-benzimidazolecarbamic acid, alkyl esters. 3,930,010, Cl. 424-273.000.
Knappe, LaVerne Frank; Sapetta, Lee Philip; Stroebel, Gary John; and Wilke, Myron Arden, to International Business Machines Corporation. Document transport device. 3,929,328, Cl. 271-267.000.
Knipstrom, Karl-Erik; Uhlig, Heinz Oskar; and Boden, Knut Folke Ingemar, to Elektriska Svetsningsaktiebolaget. Apparatus for welding vertical joints. 3,930,138, Cl. 219-126.000.
Knittel, Volker: *See—*
Beermann, Claus; Knittel, Volker; and Dursch, Walter, 3,929,874.
Knock-N-Lok: *See—*
Solo, Alan J., 3,929,311.
Kobe Steel Ltd.: *See—*
Nakamura, Yoshimi; Minami, Toshihiro; Niina, Eizi; and Mizutani, Katuzi, 3,929,517.
Kobus, Stanislas; Janssens, Juliaan Leo Gerard; and Zoile, Willy Charles Jacques, to International Standard Electric Corporation. Data processing system. 3,930,235, Cl. 340-172.500.
Koch, Richard C., to Pfizer Inc. 2-(Substituted)-5,6-dihydro-4H-1,4-thiazines used for the control of rice blast. 3,930,001, Cl. 424-246.000.
Koda, Akio: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.
Kodaira, Yasuo. Switch with an indicating mechanism. 3,930,135, Cl. 200-308.000.
Koehler Manufacturing Company: *See—*
Kreidl, Ekkehard L.; and Shooter, Douglas, 3,929,422.
Koerner, Gotz: *See—*
Rossmy, Gerd; and Koerner, Gotz, 3,929,649.
Kogler, Klaus: *See—*
Kreeb, Helmut; Hauser, Gerhard; and Kogler, Klaus, 3,929,136.

Koh, Kwang K.; Pennington, Robert E.; Vernon, Lonnie W.; and Nahas, Nicholas C., to Exxon Research and Engineering Co. Catalytic reforming process. 3,929,431, Cl. 48-214.000.

Kojimoto, Susumu: *See—*
Shibata, Osamu; Kojimoto, Susumu; Sato, Takami; and Tadokoro, Yoshio, 3,929,951.

Kokubu, Yoshikazu: *See—*
Shibata, Hiroshi; Kokubu, Yoshikazu; and Okazaki, Isao, 3,930,151.

Komatsu, Akira: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.

Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a carbide layer of a V-a group element of the periodic table on the surface of an iron, ferrous alloy or cemented carbide article. 3,930,060, Cl. 427-12.000.

Komatsu, Yoshihiro; Kakuta, Izumi; and Yamaguchi, Kanemichi, to Toyo Seikan Kaisha Limited. Hermetic sealing process utilizing multiple heat-sealing steps. 3,930,041, Cl. 426-396.000.

Komo, Tetsuya; Mizobata, Satoshi; Ukaji, Rokuo; and Kamihigoshi, Tutomu, to Daikin Kogyo Co., Ltd. Process for continuous fluorination of carbon. 3,929,920, Cl. 260-653.900.

Komoto, Hiroshi; and Ohmura, Kaoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Epoxy resin compositions. 3,929,716, Cl. 260-37.0EP.

Kondo Manufacturing Co. Ltd.: *See—*
Kondo, Shigeji, 3,929,057.

Kondo, Shigeji, to Kondo Manufacturing Co. Ltd. Hydraulic brake mechanism for an air cylinder. 3,929,057, Cl. 92-9.000.

Koninklijke Emballag Industrie Van Leer B.V.: *See—*
Leitz, Wilfried, 3,929,246.

Konishiroku Photo Industry Co., Ltd.: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.

Kono, Yoichiro: *See—*
Kanzaki, Toshihiko; Fukita, Tadazumi; and Kono, Yoichiro, 3,929,577.

Koppers Company, Inc.: *See—*
Brennan, Earl D., 3,929,977.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. Synthesis of penniclavine and elymoclavine. 3,929,796, Cl. 260-285.500.

Kornrumpf, William P.; and Harnden, John D., Jr., to General Electric Company. SCR inverter systems. 3,930,193, Cl. 321-2.000.

Korolev, Gennady Vladimirovich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.

Korose, John: *See—*
Weymann, Henry P.; and Korose, John, 3,929,703.

Kosinski, Frank J., to Unicord, Incorporated. Amplifier with overload protection. 3,930,207, Cl. 330-207.00P.

Kostelnicek, Richard J., to Exxon Production Research Company. System for transporting seismic energy detectors. 3,930,219, Cl. 340-17.000.

Kotitschke, Gerhard: *See—*
Csordas, Elemer; Gaugenmaier, Karl; and Kotitschke, Gerhard, 3,929,065.

Koturov, Daniel, to Gilson Brothers Co. Shredding machine. 3,929,236, Cl. 241-55.000.

Kotval, Peshotan S.; Hatwell, Henri; and Gortsema, Frank P., to Union Carbide Corporation. Wear-resistant surface composite materials and method for producing same. 3,929,427, Cl. 29-195.000.

Kowalski, William S., to Elan Engineering Corporation. Flow monitor and sample control device. 3,929,017, Cl. 73-198.000.

Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, to Yokohama Rubber Company, Ltd., The. Automatic tire classifying apparatus. 3,930,141, Cl. 235-61.11E.

Kozlovsky, Isaac M. Endosseous implant for prosthetic teeth. 3,928,914, Cl. 32-10.00A.

Kraftco Corporation: *See—*
Hynes, John T.; and Vakaleris, Demetrius G., 3,929,892.

Kraftwerke Union Aktiengesellschaft: *See—*
Brinkmann, Dieter; Simon, Wolfgang; and Zimon, Heinrich, 3,929,188.

Kralowetz, Bruno. High-speed short-stroke forging press. 3,929,000, Cl. 72-402.000.

Krambrock, Wolfgang, to Waeschle Maschinenfabrik GmbH. Method and apparatus for the pneumatic conveying of bulk material. 3,929,379, Cl. 302-24.000.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 1-Substituted-4-phenyl-4H-[1,2,4]triazolo[3,4-C][1,4] benzothiazines or benzoxazines. 3,929,783, Cl. 260-243.00R.

Kratel, Gunter; Patzke, Jorg; and Wegehaupt, Karl-Heinrich, to Wacker-Chemie GmbH. Organopolysiloxane elastomers admixed with fillers subjected to mechanical stress. 3,929,718, Cl. 260-37.0SB.

Krause, Janusz Josef Henryk, to Imperial Chemical Industries Limited. Anodes for electrochemical processes. 3,929,607, Cl. 204-286.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Hanslik, Wilhelm, 3,929,322.

Kreeb, Helmut; Hauser, Gerhard; and Kogler, Klaus, to Dornier System GmbH. Apparatus for low-temperature surgery. 3,929,136, Cl. 128-303.100.

Krei, Joyce Ruth: *See—*
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,929,835.

Kreidl, Ekkehard L.; and Shooter, Douglas, to Koehler Manufacturing Company. Means for recombining hydrogen and oxygen in a sealed battery and controlling recombination at catalyst surfaces. 3,929,422, Cl. 23-288.00R.

Kreiger, Keith H.: *See—*
Midland, Richard W.; Bayer, George S.; and Kreiger, Keith H., 3,930,118.

Kremer, Kenneth J.: *See—*
Burke, Noel I.; Dowell, Arthur M., Jr.; Talty, Robert D.; and Kremer, Kenneth J., 3,930,035.

Kremski, Jacob. Pool table and quick rack system. 3,929,333, Cl. 273-22.000.

Krieger, Manfred; and Suess, Rudolf, to Sandoz Ltd., (Sandoz AG). Organic compounds. 3,929,833, Cl. 260-332.20C.

Kristinsson, Haukur; and Rufenacht, Kurt, to Ciba-Geigy Corporation. Oxazolo-[4,5-b]-pyridine-2-ones and -2-thiones as intermediates. 3,929,809, Cl. 260-294.80C.

Krock, Friedrich Wilhelm; and Neeff, Rutger, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 3,929,401, Cl. 8-39.000.

Krock, Richard H.; and Pickett, Jerome J., to P. R. Mallory & Co., Inc. Infiltration of refractory metal base materials. 3,929,424, Cl. 29-182.100.

Krueger, Ronald G.: *See—*
Lewis, Albert; and Krueger, Ronald G., 3,930,091.

Kruspe, Henry R.: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.

Krutak, James J., Sr.: *See—*
Landholm, Richard A.; Haase, Jan R.; and Krutak, James J., Sr., 3,929,760.

Kubota, Koji; Yoshihara, Yasuhiko; and Hirose, Yoshio, to Ajinomoto Co., Inc. Process for preparing L-lysine. 3,929,571, Cl. 195-29.000.

Kubotera, Kikuo; Mizuki, Eiichi; Fujiwara, Tadahiro; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Etch bleaching processes for making lithographic printing plates using silver halide and/or diffusion transfer layers and a hydrophilic layer. 3,929,481, Cl. 96-29.00L.

Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, to Sumitomo Chemical Company, Limited. Process for preparing petroleum resin copolymers of C_4 and C_5 aliphatic monoolefin fractions and styrene or its derivatives. 3,929,747, Cl. 260-80.780.

Kudo, Tetsuichi; Gejyo, Tetsuo; Yoshida, Kazuetsu; and Seki, Michiharu, to Hitachi, Ltd. Catalyst. 3,929,670, Cl. 252-455.00R.

Kuehn, Erich, to ICI United States Inc. Vinyl urethane resins. 3,929,929, Cl. 260-859.00R.

Kuhle, Engelbert: *See—*
Siegle, Peter; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,929,838.

Kuhn, Hans H.: *See—*
Farmer, Larry B.; Hendrix, James E.; and Kuhn, Hans H., 3,929,406.
Hendrix, James E.; and Kuhn, Hans H., 3,929,013.

Kuhn, Harry A., Jr., to Motorola, Inc. Cmos odd multiple repetition rate divider circuit. 3,930,169, Cl. 307-225.00C.

Kuhrt, Winfried; Derleth, Helmut; and Fischer, Hermann, to Kali-Chemie Aktiengesellschaft. Catalyst for decomposing hydrazine and its derivatives and process of making same. 3,929,682, Cl. 252-466.0PT.

Kuipers, Arie, to Molkerei J. A. Meggle, Milchindustrie. Method of preparing a protein concentrate from whey. 3,930,039, Cl. 426-271.000.

Kumagai, Ryohei: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.

Kumakawa, Shiro: *See—*
Kawase, Shoji; Maeda, Kenji; Kumakawa, Shiro; and Kuratsuji, Takatoshi, 3,929,180.

Kumar, Surinder; and Ramachandran, Kolar S. Modified vegetable protein simulating casein. 3,930,058, Cl. 426-656.000.

Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, to Takasago Perfumery Co., Ltd. Process for preparing cyclohexadecenone-5. 3,929,893, Cl. 260-586.00R.

Kumiai Chemical Industry: *See—*
Kimura, Ichiro; Sugiyama, Hironari; Takita, Kiyoshi; and Mizutani, Makoto, 3,929,452.

Kummer, Horst; and Beckmann, Ruediger. Lowering blood cholesterol and lipid levels. 3,930,017, Cl. 424-309.000.

Kummer, Rudolf: *See—*
Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, 3,929,898.

Kuppenheimer, John D., Jr.: *See—*
Chicklis, Evan P.; and Kuppenheimer, John D., Jr., 3,930,158.

Kurata, Takeo; Hayazaki, Tamotsu; and Murakami, Kyoko, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for producing spun yarn-like bulked yarns. 3,928,958, Cl. 57-157.0TS.

Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, to Mitsubishi Chemical Industries, Ltd. Process for hydrating a nitrile to the corresponding amide. 3,929,881, Cl. 260-561.00N.

Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, to Mitsubishi Chemical Industries, Ltd. Process for preparing concentrated titanium mineral. 3,929,963, Cl. 423-86.000.

Kuratsuji, Takatoshi: *See—*
Kawase, Shoji; Maeda, Kenji; Kumakawa, Shiro; and Kuratsuji, Takatoshi, 3,929,180.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Nakamura, Tadashi; and Hagiwara, Hisami, 3,929,950.
Shibata, Hiroshi; Kokubu, Yoshikazu; and Okazaki, Isao, 3,930,151.

Kuribayashi, Hideyuki: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 3,929,747.

Kurilov, Georgy Vasilievich: *See—*
Ainbinder, Emmanuil Gershkovich; Kurilov, Georgy Vasilievich; and Neustroev, Leonid Sergeevich, 3,928,983.

Kurtz, Roman: *See—*
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, 3,929,955.

Kuwana, Noriaki; Suzuki, Kouichi; and Sugitani, Tooru, to Eisai Co., Ltd. Method for the production of N-acylpentapeptides 3,929,572, Cl. 195-29.000.

Kuzminski, Henry William, to RCA Corporation. Method for etching apertured work piece. 3,929,532, Cl. 156-11.000.

Kyburz, Emilio: *See—*
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,929,791.

Kydonieus, Nicholas; and Sandler, Stanley Robert, to Pennwalt Corporation. Process for preparing α,β-unsaturated thiolesters. 3,929,852, Cl. 260-455.00R.

La Cellophane: *See—*
Quang, Pham Kim; and Gasdoue, Rene, 3,930,257.

Labaz: *See—*
Benoit-Guyod, Martine Pierrette; Benoit-Guyod, Jean-Louis Alain; Boucherle, Andre Louis; and Eymard, Pierre Luc, 3,929,869.

La Cosse, Gerald E.: *See—*
Houlihan, William F., deceased; Newell, Isaac Laird; and La Cosse, Gerald E., 3,929,514.

La Croce, Leonard Thomas, to American Can Company. Child-resistant closure for metal container. 3,929,252, Cl. 220-269.000.

Lacroix, Roger, to Sea Tank Co. Method and device for a foundation by depression in an aquatic site. 3,928,982, Cl. 61-50.000.

Ladisch, Gerhard, to Pfrengle, Otto. Spray mixing nozzle. 3,929,291, Cl. 239-425.000.

L'Air Liguide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes: *See—*
Zumbrunn, Jean-Pierre, 3,929,636.

Lambrecht, Ralph E.; and Najimian, Harry, Jr., to Outboard Marine Corporation. Stern drive hydraulic trim control system including a tilt position indicator. 3,929,089, Cl. 115-41.0HT.

Lambrechtse, Cornelis Willem: *See—*
Salters, Roelof Herman Willem; Boonstra, Lieuwe; and Lambrechtse, Cornelis Willem, 3,930,239.

Landholm, Richard A.; Haase, Jan R.; and Krutak, James J., Sr., to Eastman Kodak Company. Cyan image-providing phenylazonaphthyl dyes. 3,929,760, Cl. 260-197.000.

Lange, Wilfried, to Dieter Haubold Industrielle Nagelgerate. Stapler release safety mechanism. 3,929,056, Cl. 91-461.000.

Langhoff, Boris: *See—*
Stiltz, Erwin; Langhoff, Boris; and Spieth, Manfred, 3,929,195.

Lapham Engineering, Inc.: *See—*
Lapham, Sidney D., 3,928,888.

Lapham, Sidney D., to Lapham Engineering, Inc. Interchangeable caster with inclined axle and lint protection means. 3,928,888, Cl. 16-35.00R.

Larin, Vladimir Borisovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorofeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.

Larkin, John M.: *See—*
Duranleau, Roger G.; and Larkin, John M., 3,929,845.

Larsen, Glen D., to Southern Railway Company. Empty and load brake apparatus. 3,929,384, Cl. 303-22.00R.

Larsen, Ole Jeppe Fjord. Apparatus for producing and protecting deposits of sedimentary material on floors of bodies of water. 3,928,978, Cl. 61-3.000.

Lasag S.A.: *See—*
Leuenberger, Hans-Ulrich; and Stemme, Reiner, 3,929,443.

Laskey, Richard A., to Datascope Corporation. Hydrophilic acrylamido polymers. 3,929,741, Cl. 260-79.30M.

Lauck, Robert M.: *See—*
Feminella, Joseph V.; Melachouris, Nicholas; and Lauck, Robert M., 3,930,056.

Laughlin, Robert Gene; and Heuring, Vincent Paul, to Procter & Gamble Company, The. Detergent composition having enhanced particulate soil removal performance. 3,929,678, Cl. 252-526.000.

Laurent, Serge: *See—*
Cronenberger, Michel; Laurent, Serge; and Mallet, Maurice, 3,930,070.

Lavallee, Francois A.: *See—*
Orlando, Charles M.; and Lavallee, Francois A., 3,929,908.

Lawrence, Ray V.: *See—*
Severson, Ray F.; Schuller, Walter H.; Joye, N. Mason, Jr.; and Lawrence, Ray V., 3,929,755.

Laws, Harold H., to Olin Corporation. Method and apparatus for producing corrugated tubing. 3,928,997, Cl. 72-178.000.

Lawwill, Ronald C., to Allied Chemical Corporation. Tongue for inflataband. 3,929,348, Cl. 280-150.0AB.

Leach, Charles Willard: *See—*
Albright, Denton M.; and Leach, Charles Willard, 3,930,025.

Leanza, William J.: *See—*
Christensen, Burton G.; Leanza, William J.; and Albers-Schonberg, Georg, 3,929,840.

Lear Siegler, Inc.: *See—*
Masser, Lloyd D., 3,929,347.

Lecon, Andrew P., to Babcock & Wilcox Company, The. Heat exchanger structure. 3,929,189, Cl. 165-69.000.

Leddy, James J.; and Gritzner, Gerhard, to Dow Chemical Company, The. Zinc-bromide secondary cell. 3,929,506, Cl. 136-86.00A.

Ledoux, Claude: *See—*
Thomas, Jean-Claude; Raoul, Pierre; and Ledoux, Claude, 3,929,100.

Lee, Henry L.; Orlowski, Jan A.; and Butler, David V. Device for testing wear resistance of dental restorative materials. 3,929,001, Cl. 73-7.000.

Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Dental base material. 3,929,493, Cl. 106-35.000.

Lee, Kenneth: *See—*
Guarnieri, C. Richard; Lee, Kenneth; and Onton, Aare, 3,930,241.

Lee Pharmaceuticals: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan A., 3,929,493.

Lee, S. Yen, to United States of America, Army. Alcohol sensitive repairable epoxy embedding material. 3,929,717, Cl. 260-37.0EP.

Leeman, Susan E.; and Carraway, Robert E., to Brandeis University. Synthetically produced tridecapeptide having the same activity as the hypothalamic substance, neurotensin. 3,929,756, Cl. 260-112.50R.

Legille, Edouard; and Mahr, Rene N., to S.A. des Anciens Etablissements Paul Wurth. Shaft furnace charging process. 3,929,240, Cl. 214-152.000.

Leiber, Heinz, to Teldix GmbH. Method and arrangement for applying oscillating braking pressures to vehicle wheels. 3,929,380, Cl. 303-21.00F.

Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Alkylation of iodinin. 3,929,790, Cl. 260-267.000.

Leine, Lars: *See—*
Fredin, Bo; and Leine, Lars, 3,929,565.

Leitereg, Theodore J.; Guadagni, Dante G.; and Teranishi, Roy, to United States of America, Agriculture. Process for the preparation of isopropenyl-bicyclo[4,4,0]dec-1-en-3-ones. 3,929,894, Cl. 260-586.00P.

Leitz, Wilfried, to Koninklijke Emballag Industrie Van Leer B.V. Plastic container cap unit with integral sealing ring. 3,929,246, Cl. 215-252.000.

Lemberg, Seymour, to International Flavors & Fragrances Inc. Novel products and processes. 3,929,675, Cl. 252-522.000.

Lenton, Robert Warren: *See—*
Russell, Donald Henry; and Lenton, Robert Warren, 3,929,727.

Leonard, Ronald J., to Baxter Laboratories, Inc. Blood oxygenator utilizing a removable membrane oxygenator unit. 3,929,414, Cl. 23-258.500.

Leonard, William J.: *See—*
Dale, James A.; and Leonard, William J., 3,930,047.

Leong, Chai Mun. I.C. engine improvements. 3,929,118, Cl. 123-198.00A.

Lepagnol, Guy Pierre: *See—*
Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,930,147.

Leroy, Pierre; Debras, Maurice; Cadart, Michel; and Saleil, Jean, to Creusot-Loire. Process for the elaboration of chrome steels. 3,929,458, Cl. 75-12.000.

Leuenberger, Hans-Ulrich; and Stemme, Reiner, to Lasag S.A. Method for curing fissures and the like of workpieces formed of metal oxide materials and processed under high material stress. 3,929,443, Cl. 65-117.000.

Leverett, Glenn Frederick, to Du Pont de Nemours, E. I., and Company. Process for reducing filler loss in tetrafluoroethylene polymer particles. 3,929,721, Cl. 260-42.150.

Levers, William E.; and Keith, Charles H., to Celanese Corporation. Filters. 3,930,077, Cl. 427-384.000.

Levin, Alfred A.: *See—*
Richter, Sidney B.; and Levin, Alfred A., 3,929,830.

Levresse, Bernard: *See—*
Gloriod, Pierre; Levresse, Bernard; and Machon, Jean-Pierre, 3,929,754.

Levy, Stephen David; and Rauch, Francis Clyde, to American Cyanamid Company. Process for the mononitration of ortho-xylene. 3,929,916, Cl. 260-645.000.

Lewis, Albert; and Krueger, Ronald G., to Kaiser Glass Fiber Corporation. Unidirectional webbing material. 3,930,091, Cl. 428-198.000.

Lewis, Charles A., to United States of America, Navy. Explosive charge pistol. 3,929,055, Cl. 89-1.00M.

Lewin, J. Stephen; and Sapkus, Jurgis, to Mattel, Inc. Controller for a figure toy. 3,928,934, Cl. 46-119.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Bretting, Jork, 3,930,182.
Stiltz, Erwin; Langhoff, Boris; and Spieth, Manfred, 3,929,195.

Liddle, Robert: *See—*
Pyne, Bernard; and Liddle, Robert, 3,929,265.

Liebman, Alan J., to Xerox Corporation. Toner loading for touchdown donor. 3,929,098, Cl. 118-637.000.

Liede, Dieter: *See—*
Buchner, Norbert; Liede, Dieter; Schmeer, Peter; and Vogele, Gunther, 3,929,409.

Lieske, Manfred: *See—*
Olsen, Willi; and Lieske, Manfred, 3,930,188.

Lilly Industries, Ltd.: *See—*
Cashin, Colin H.; Chakrabarti, Jiban K.; and Szinai, Stephen S., 3,929,888.

Linatex Corporation of America: *See—*
Ennis, Robert E.; and Derrick, Robert G., 3,929,642.

Lindberg, Ulf Engelbert: *See—*
Stromberg, Nils Erik; and Lindberg, Ulf Engelbert, 3,929,063.

Lindburg, Norman Lee: *See—*
Blust, Henry Leo; Lindburg, Norman Lee; and Henry, Dale Vernon, 3,929,426.

Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., to American Gas Association, Inc. Production of hydrocarbon gases from oil shale. 3,929,615, Cl. 208-11.000.

Lindqvist, Karl. Locking device. 3,929,300, Cl. 242-107.400.

Linge, Hermann: *See—*
Gehrig, Heinz; Linge, Hermann; and Wagner, Sepp, 3,929,542.

Liot, Evelyne: *See—*
Liot, Roger; and Liot, Evelyne, 3,930,054.

Liot, Roger; and Liot, Evelyne. Method of making improved dried egg product. 3,930,054, Cl. 426-614.000.

Lipe Rollway Corporation: *See—*
Armstrong, Jack W., 3,929,221.

Lipha Lyonnaise Industrielle Pharmaceutique: *See—*
Boschetti, Eugene, 3,929,983.

Liska, Manfred, to Siemens Aktiengesellschaft. Brushless DC motor having multiple stator windings. 3,930,190, Cl. 318-254.000.

Litschi, Gerold: *See—*
Guenst, William C., Jr.; and Litschi, Gerold, 3,929,046.

Litton Systems, Inc.: *See—*
Pinkham, Philip C., 3,930,083.

Liu, Robert Chung-Huang: *See—*
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,929,758.

LLewellyn, Peter M., to Varian Associates. Method and apparatus for detecing materials in a liquid. 3,929,003, Cl. 73-61.00R.

Llewellyn, Thomas Oscar: *See—*
Schwartz, Murray Arthur; and Llewellyn, Thomas Oscar, 3,929,947.

Locke, Frank W.; and Sorenson, John F., to Hoerner Waldorf Corporation. Short bicycle pack. 3,929,225, Cl. 206-335.000.

Loderer, Peter, to Siemens Aktiengesellschaft. Braking circuit for the mixed regenerative and resistance braking of a d-c series machine operated as a generator. 3,930,191, Cl. 318-376.000.

Logothetis, Anestis Leonidas: *See—*
Cooper, Terence Alfred; and Logothetis, Anestis Leonidas, 3,929,749.

Lopez, Manuel; and Bourassa, Joseph R., to Parker-Hannifin Corporation. Windshield wiper coupling structures. 3,928,887, Cl. 15-250.320.

Losee, Kathryn Alice: *See—*
Wojnar, Robert John; Brittain, Russell James; Bernstein, Jack; and Losee, Kathryn Alice, 3,930,005.

Lotte Co., Ltd.: *See—*
Kim, Kenneth; and Suzuki, Shigemutsu, 3,929,436.

Lotz, Horst K.; and Otto, Bernhard, to GeGa Gesellschaft fur Gasetechnik Lotz KG. Flame cutting machine. 3,929,324, Cl. 266-23.00K.

Lovell, James Byron, to American Cyanamid Company. Novel method of protecting cotton plants from insect attack. 3,929,998, Cl. 424-200.000.

Lovitz, David D.: *See—*
Suchowski, Bernard; Lovitz, David D.; and Kissin, Claud W., 3,929,102.

Lubbers, Dietrich W.; and Huch, Albert, to Eschweiler & Co. Apparatus for quickly evaluating gases dissolved in blood. 3,929,605, Cl. 204-195.00P.

Lubke, Hans-Joachim: *See—*
Biberbach, Peter; Dietschmann, Werner; and Lubke, Hans-Joachim, 3,929,595.

Luca, Vasile: *See—*
Constantin, Gurgui N.; Luca, Vasile; Eckardt, Andras; and Ciulacu, Paraschiv I., 3,930,088.

Lucas Aerospace Limited: *See—*
Maker, Paul Mainwaring, 3,928,962.

Lucas, Roy N., to Petrolite Corporation. Shale oil purification. 3,929,625, Cl. 208-188.000.

Lucero, Ronald Ray. Process and apparatus for removing ions from fluids. 3,929,433, Cl. 55-3.000.

Ludeke, Rudolf: *See—*
Chang, Leroy L.; Esaki, Leo; and Ludeke, Rudolf, 3,929,527.

Ludeman, Russell S. Self-contained survival device. 3,929,223, Cl. 206-234.000.

Luhman, Robert A.: *See—*
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., 3,929,552.

Lukacs, George J.: *See—*
Drelich, Arthur H.; and Lukacs, George J., 3,930,073.
Drelich, Arthur H.; and Lukacs, George J., 3,930,074.

Lummus Company, The: *See—*
Gelbein, Abraham P.; Sze, Morgan C.; and Paustian, John E., 3,929,811.

Lundstrom, Goran Ingemar; Hartmann, Friedrich; and Huijsers, Willem, to Hugin Kassaregister AB. Device for setting type carrying means in a printing device having at least one printing position, especially for cash registers. 3,929,276, Cl. 235-61.0PK.

Lussier, Roger J.; Magee, John Storey, Jr.; and Albers, Edwin Wolf, to W. R. Grace & Co. Copper containing hydrocarbon cracking catalyst. 3,929,621, Cl. 208-120.000.

Luth, Claus-Peter. Magnetic control device for yarn guides. 3,928,988, Cl. 66-138.000.

Luthi, Hanspeter. Sets of units for constructing various types of stand. 3,929,230, Cl. 211-177.000.

Lutz, Jean; Traille, Andre; and Besnard, Francois, to Societe Nationale des Petroles d'Aquitaine. Measurement of drilling torque. 3,929,009, Cl. 73-136.00A.

Lutz, Karl-Anton, to Siemens Aktiengesellschaft. PCM time-division multiplex telecommunication network. 3,930,124, Cl. 179-15.0AT.

Luwa AG: *See—*
Ferri, Johann Walter, 3,928,892.
Sutter, Hanspeter, 3,928,884.

Lynes, Inc.: *See—*
Coone, Malcolm G., 3,929,175.

Macbeth, Albert W., to Thiokol Corporation. Rocket motor construction. 3,928,965, Cl. 60-255.000.

Mac Bride, William R.: *See—*
Parker, Frederick A.; and Mac Bride, William R., 3,929,588.

MacCurdy, William K., to Evans Products Company. End of car cushioning unit. 3,929,232, Cl. 213-43.000.

MacFarlane, Thomas R., to Whirlpool Corporation. Refuse compactor with receptacle controlled actuation. 3,929,064, Cl. 100-53.000.

Machida, Katsutoshi: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.

Machon, Jean-Pierre: *See—*
Gloriod, Pierre; Levresse, Bernard; and Machon, Jean-Pierre, 3,929,754.

MacKenzie, Burton Thornley, Jr.; and Wilkus, Edward Vincent, to General Electric Company. Flame-resistant polyolefin used as insulator for electrical conductors. 3,930,104, Cl. 428-379.000.

MacMillan Bloedel Limited: *See—*
Procter, Alan R., 3,929,559.

MacPherson, Alastair George: *See—*
Ferguson, Alisdair Cullen; McGregor, John; and MacPherson, Alastair George, 3,930,236.

Madden, Thomas J., Jr.: *See—*
Dick, George H.; and Madden, Thomas J., Jr., 3,930,258.

Maddock, Don G., to General Motors Corporation. Power train including a torque-pressure transducer. 3,929,211, Cl. 192-54.000.

Maeda, Kenji: *See—*
Kawase, Shoji; Maeda, Kenji; Kumakawa, Shiro; and Kuratsuji, Takatoshi, 3,929,180.

Magazzu, Ronald A. Mechanical baseball umpire. 3,929,334, Cl. 273-26.00A.

Magee, John Storey, Jr.: *See—*
Lussier, Roger J.; Magee, John Storey, Jr.; and Albers, Edwin Wolf, 3,929,621.

Maggioni, Paolo, to Brichima S.p.A. Process for preparing diphenols. 3,929,913, Cl. 260-621.00G.

Magnesium Elektron Limited: *See—*
Hancock, John Douglas; and Hepworth, Matthew A., 3,929,498.

Mahr, Rene N.: *See—*
Legille, Edouard; and Mahr, Rene N., 3,929,240.

Maida, Osamu, to Nippon Kogaku K.K. Circuit for converting an analog input signal voltage into a digital representation. 3,930,253, Cl. 340-347.0AD.

Maiken, Francis H. Umbrella tent. 3,929,146, Cl. 135-2.000.

Maiworm, Gunter. Yarn cutting-off machine. 3,928,899, Cl. 28-19.000.

Maker, Paul Mainwaring, to Lucas Aerospace Limited. Fuel control systems for gas turbine engines. 3,928,962, Cl. 60-39.28R.

Malagari, Frank A.: *See—*
Salsgiver, James A.; and Malagari, Frank A., 3,929,522.

Malcolm, Donald B., to Dravo Corporation. Reciprocating variable speed material transfer conveyor system. 3,929,219, Cl. 198-111.000.

Malick, Franklin S. Electronic exercise aid. 3,929,335, Cl. 272-7.00R.

Malina, Jerry L.: *See—*
Van Dyck, Emil J.; Malina, Jerry L.; and Schiller, Raymond E., 3,929,545.

Mallet, Maurice: *See—*
Cronenberger, Michel; Laurent, Serge; and Mallet, Maurice, 3,930,070.

Malott, Corwin; and Erath, Robert William, to Alumax Mill Products, Inc. Lateral roll irrigation machine having remote end control. 3,929,197, Cl. 180-2.000.

Manghisi, Elso; and Cascio, Giuseppe, to Istituto Luso Farmaco d'Italia S.r.l. 4-Aryl-5-aminoalkyl-4-oxazolin-2-ones. 3,930,008, Cl. 260-268.0PH.

Mangold, Dietrich: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,929,454.

Mansfield, Ernest Bryant, to Fisher Scientific Company. Automatic carbon dioxide incubator. 3,929,584, Cl. 195-127.000.

Mansfield Sanitary Inc.: *See—*
Flinner, Vaughn D.; and Sprang, Richard W., 3,929,150.

Mao, George W., to Gould Inc. Lead alloy products. 3,929,513, Cl. 148-3.000.

Marans, Nelson S.; and Gluecksmann, Alfred, to W. R. Grace & Co. Radiatior polymerizable epoxy composition. 3,929,927, Cl. 260-837.0R.

Marantette, Ruth B.: *See—*
Marantette, William F.; and Marantette, Ruth B., 3,929,393.

Marantette, William F.; and Marantette, Ruth B. Water-rubber bearing high speed drill spindle. 3,929,393, Cl. 308-76.000.

Marantette, William F., to Digital Systems, Inc. Apparatus for determining the centroid of a lighted hole. 3,930,150, Cl. 250-203.00R.

Marathon Oil Company: *See—*
Duke, Roy B., 3,929,193.
Jones, Stanley C., 3,929,011.

Marchenko, Vladimir Zakharovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Marchione, Guido. Rotating system. 3,929,034, Cl. 74-575.000.

Margolin, Efraim; and Grunstein, Michael, to Grun Mar Industries, Inc. Adjustable bracket assembly. 3,929,228, Cl. 211-102.000.

Margraf, Harry W., to Washington University. Silver-zinc allantoinate compositions and method of killing bacteria and fungi therewith. 3,930,000, Cl. 424-245.000.

Marincic, Nikola: *See—*
Bro, Per; Kelsey, Robert H.; and Marincic, Nikola, 3,929,507.

Marino, Frank; and Hadnagy, Thomas D. Paint brush. 3,928,886, Cl. 15-144.00A.

Marquet, Freddy Antoine, to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie. Device for measuring the cooling time of welds. 3,930,159, Cl. 250-338.000.

Marsch, James E., to Allis-Chalmers Corporation. Six speed power shift transmission. 3,929,037, Cl. 74-759.000.

Martin, Jack, to Westinghouse Electric Corporation. Single-ended incandescent lamp having a simplified filament-mount. 3,930,177, Cl. 313-271.000.

Marvin Glass & Associates: *See—*
Breslow, Jeffrey D., 3,929,336.

Marx, Thomas O., to Atwood Vacuum Machine Company. Vehicle parking brake control. 3,929,033, Cl. 74-512.000.

Marze, Xavier: *See—*
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 3,930,105.

Mashlenko, Felix Isaakovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Mask, E. Dale: *See—*
Beeding, Jack D., 3,929,331.

Mason, Scott M. Trimaran. 3,929,085, Cl. 114-123.000.

Mason, William H.: *See—*
Abbate, John; Jewett, Warren R.; and Mason, William H., 3,929,250.

Massachusetts Institute of Technology: *See—*
Johansen, Inge; and Tong, David W., 3,930,113.

Masser, Lloyd D., to Lear Siegler, Inc. Tandem wheel suspension system for closely adjacent wheels. 3,929,347, Cl. 280-104.50R.

Masson Scott Thrissell Engineering Limited: *See—*
Walkington, Colin, 3,929,299.

Masuda, Katsutada: *See—*
Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,929,775.

Materiel Electrique de Controle et Industriel: *See—*
Midy, Michel, 3,929,148.

Mathiesen, Odd, to International Standard Electric Corporation. Method for converting a binary coded data signal into a P-FSK coded signal. 3,930,121, Cl. 178-66.00R.

Matsubara, Hironaga: *See—*
Miyauchi, Hirokazu; and Matsubara, Hironaga, 3,929,724.

Matsuda, Hideya: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.

Matsui, Hirofumi. Bath composition for human body. 3,929,997, Cl. 424-195.000.

Matsumoto, Ryoichiro: *See—*
Takeuchi, Kazuhiko; and Matsumoto, Ryoichiro, 3,929,016.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hayakawa, Toshio, 3,929,215.
Ikeda, Hisao, 3,929,093.
Nakamura, Harutoki; and Yagi, Jun, 3,929,671.
Tanigawa, Shizuhiko; Kikuya, Satoshi; Yamazoe, Yoshinori; and Nakamura, Chihiro, 3,930,270.

Matsushita Electronics Corporation: *See—*
Hattori, Hirotsugu; and Takayama, Yuichiro, 3,929,531.

Matsuyama, Glen: *See—*
Smith, William Paul; and Matsuyama, Glen, 3,929,222.

Mattel, Inc.: *See—*
Lewis, J. Stephen; and Sapkus, Jurgis, 3,928,934.
Maurer, Donald John, 3,928,932.

Mattioli, Luciano, to S.I.T.A.V. S.p.A. - Societa Incremento Turistico Alberghiero Valdostano. Device for distribution of playing-cards. 3,929,339, Cl. 273-148.00A.

Mattox, Ernest M.: *See—*
Beeding, Jack D., 3,929,331.

Mattson, Peter H., to S & W Fine Foods, Inc. Process for preparing a shelf-stable, flexible tortilla. 3,930,049, Cl. 426-549.000.

Maughan, William G., to Westvaco Corporation. Moisture resistant corner post. 3,929,536, Cl. 156-85.000.

Maurer, Donald John, to Mattel, Inc. Animated figure toy. 3,928,932, Cl. 46-118.000.

Mauroner, Curtis. Materials dispensing apparatus. 3,929,173, Cl. 141-74.000.

Mavrovic, Ivo. Decomposition of ammonium carbamate. 3,929,878, Cl. 260-555.00A.

Maximov, Sergei Mikhailovich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.

May, Earl L.; and Fisher, Joseph J., to PPG Industries, Inc. Apparatus for making flat glass including an edge stretching apparatus. 3,929,444, Cl. 65-182.00R.

Mayer, Hans Johann: *See—*
Fischli, Albert Eduard; Klaus, Michael Josef; Mayer, Hans Johann; and Wick, Alexander Eduard, 3,929,853.

Mayerhoefer, Horst; Mueller, Wolfgang; Sollberger, Urs; and Wolf, Rainer, to Sandoz Ltd., (Sandoz AG). Halogen-containing phosphoric acid esters. 3,929,940, Cl. 260-930.000.

Mayers, Bernard J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Mayers, Bernard J., 3,929,919.

Maynard, David Payne: *See—*
Weaver, John; Maynard, David Payne; Taylor, Rayner Walter; and Bayliss, William Richards Gilbert, 3,929,377.

Maynard, Walter P., Jr. Double sealing pouring assembly. 3,929,264, Cl. 222-525.000.

Mazzoni, Renato J.; Bowser, George H.; and Stewart, John L., to PPG Industries, Inc. Packaged add-on multiple glazing units and method. 3,928,953, Cl. 52-172.000.

McAvoy, Dennis J., to Sperry Rand Corporation. Power transmission. 3,929,159, Cl. 137-596.180.

McCaffrey, Francis Hamnet Garland: *See—*
Findlay, Donald Urquhart; McCaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,960.

McCollum, Anthony W.; and Hull, David C., to Eastman Kodak Company. Mixed ester plastic additive. 3,929,867, Cl. 260-475.00P.

McCornack, Richard W.: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.

McCrae, James McGeachie, to Ciba-Geigy Corporation. Unsymmetrical bisazomethine metal complex pigments. 3,929,794, Cl. 260-270.000.

McCulloch Corporation: *See—*
Burkett, Wilford B.; and Orsino, Joseph A., 3,929,505.

McDonald, Charles H. Elastomeric cold patch for pavement repair. 3,930,100, Cl. 428-323.000.

McDonnell Douglas Corporation: *See—*
Eckhardt, Fred A., 3,929,358.

McGaffrey, Francis Hamnet Garland: *See—*
Findlay, Donald Urquhart; McGaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,959.

McGehee, John W. Reciprocating gang saw. 3,929,048, Cl. 83-751.000.

McGregor, John: *See—*
Ferguson, Alisdair Cullen; McGregor, John; and MacPherson, Alastair George, 3,930,236.

McLeod, Willard W., Jr.; and Heaton, John F., to Raytheon Company. Digital apparatus. 3,930,238, Cl. 340-173.00R.

McManus, Francis: *See—*
Banks, David Dugmore; and McManus, Francis, 3,929,061.

McNeil Corporation: *See—*
Pamer, Karl A., 3,929,229.

McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., to Eaton Corporation. Skid control system. 3,929,382, Cl. 303-21.0BE.

McQueary, Hobert O.: *See—*
Shoemaker, Philip D.; and McQueary, Hobert O., 3,930,110.

McRae, William V., Jr.; and Stuart, John J., Jr., to Transyt Corporation. Means of high mass flow transportation. 3,929,076, Cl. 104-25.000.

Mead Corporation, The: *See—*
Spatz, Sidney M., 3,929,825.

Mead, Theodore C.; Ashton, William B.; and Shillinglaw, John P., Jr., to Texaco Inc. Manufacture of lubricating oils. 3,929,616, Cl. 208-87.000.

Means, Robert W., to United States of America, Navy. Analog to digital conversion by charge transfer device. 3,930,255, Cl. 340-347.0AD.

Mechler, Helmut: *See—*
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, 3,929,907.

Meckbach, Heinrich: *See—*
Schmidt, Adolf; Bartl, Herbert; and Meckbach, Heinrich, 3,929,706.

Medrano, Joseph, Jr. Method of producing continuous lengths of reinforced plastic pipe. 3,929,544, Cl. 156-189.000.

Medrick, John D.: *See—*
Harrison, Robert S.; Medrick, John D.; and Nowroski, Alvin P., 3,929,942.

Medvedev, Alexandr Yakovlevich: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Rossomakho, Yakov Vulfovich; and Butova, Margarita Nikolaevna, 3,930,139.

Meier, Carl H., to Gulf & Western Industries, Inc. Digital timer and counter device with dual control. 3,930,142, Cl. 235-92.0EV.

Meinert, Norbert: *See—*
Broemer, Heinz; and Meinert, Norbert, 3,929,495.

Melachouris, Nicholas: *See—*
Feminella, Joseph V.; Melachouris, Nicholas; and Lauck, Robert M., 3,930,056.

Merck & Co., Inc.: *See—*
Christensen, Burton G.; Leanza, William J.; and Albers-Schonberg, Georg, 3,929,840.
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Woltersdorf, Otto W., Jr., 3,929,872.
Reinhold, Donald F., 3,929,576.
Swigert, Roger D., 3,929,858.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,929,880.

Merianos, John J.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,929,990.

Merton, Harry; and Howlitt, Thomas Michael, to Winget Limited. Slurry pumps. 3,929,400, Cl. 417-516.000.

Merz, William Carl, to United States of America, Navy. Reserve battery. 3,929,508, Cl. 136-114.000.

Meshkov, Jury Yakovlevich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Meshri, Dayal T.; White, Wayne E.; and Sowell, Charles L., to Ozark-Mahoning Company. Synthesis of fluorographite. 3,929,918, Cl. 260-653.900.

Metlesics, Werner; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Novel 2[2-(1,3-diazacycloalk-2-enyl)]benzophenone derivatives and novel 1,3-diazacycloalkenyl[2,1-A]isoindole derivatives. 3,929,766, Cl. 260-239.0BC.

Metz, Ferdinand E.; Boyce, Finis O.; and Segmiller, James L., to H. J. Heinz Company. Process for making a barbecue sauce with tenderizer. 3,930,030, Cl. 426-63.000.

Metzeler Kautschuk AG: *See—*
Britschinn, Horst; Federer, Fritz; and Neumann, Henning, 3,928,879.

Meuken, Hermann: *See—*
Morsbach, Martin; Johren, Paul; and Meuken, Hermann, 3,929,342.

Meyer, Gerhard: *See—*
Toth, Anton; Rupp, Hans-Dieter; and Meyer, Gerhard, 3,929,877.

Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-1,4-dihydropyridine derivatives. 3,929,798, Cl. 260-287.00K.

Meyer, Jeffrey G.: *See—*
Huerta, James R.; Anderson, Amos R.; and Meyer, Jeffrey G., 3,929,745.

Meyer, Robert F.: *See—*
Holmes, Ann; and Meyer, Robert F., 3,929,856.

Meyer-Simon, Eugen: *See—*
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, 3,929,907.

Meyer, Urs: *See—*
Schmid, Wolfgang; Gutzwiller, Ernst; and Meyer, Urs, 3,929,806.

Meyers, George L., to American Can Company. Carton and blank therefor. 3,929,271, Cl. 229-4.500.

Michaud, Gregory L.: *See—*
Sharpe, Anthony N.; and Michaud, Gregory L., 3,929,583.

Michelet, Daniel, to Rhone-Poulenc, S.A. Preparation of glyoxylic acid. 3,929,613, Cl. 204-77.000.

Michinori, Koyama: *See—*
Hiroshi, Miyazakai; Kazuo, Kato; and Michinori, Koyama, 3,929,757.

Middelhoek, Servaas: *See—*
Peters, Franciscus J. W. M.; Middelhoek, Servaas; and Rijkeboer, Albert, 3,929,460.

Midland, Richard W.; Bayer, George S.; and Kreiger, Keith H., to General Time Corporation. Radar recorder system. 3,930,118, Cl. 178-6.70R.

Midland-Ross Corporation: *See—*
Durling, Harold, 3,929,381.

Midy, Michel, to Materiel Electrique de Controle et Industriel. Differential and proportional pneumatic amplifiers. 3,929,148, Cl. 137-84.000.

Miescher, Guido M., to Commercial Solvents Corporation. Method of producing glutamic acid by fermentation. 3,929,575, Cl. 195-30.000.

Mihara, Hiromichi; Yajima, Yuzuru; and Ide, Yadenji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Animal hair-like synthetic fiber. 3,930,106, Cl. 428-399.000.

Mikamo, Masahiro: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Mikhailov, Konstantin Vasilievich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Miland, Marie. Portable ramp. 3,928,882, Cl. 14-72.000.

Miles Laboratories, Inc.: *See—*
Corliss, Glenn Arthur; and Furgal, Henry Paul, 3,930,033.

Millard, Gregory S. T.: *See—*
Donaldson, Desmond M.; and Millard, Gregory S. T., 3,929,643.

Miller, James E.: *See—*
Morrill, Elliott; and Miller, James E., 3,929,697.

Miller, Richard C., to Gates Rubber Company, The. Synthesis of 4,5-diaminouracil and its salts. 3,929,788, Cl. 260-256.40C.

Miller, Richard C.; and Payne, Charles C., to Nalco Chemical Company. Correcting for non-uniformity of a silica sol coating. 3,930,063, Cl. 427-54.000.

Miller, Robert W.; and Howell, Samuel Garry, to Diamond Shamrock Corporation. Platable polypropylene composition. 3,929,702, Cl. 260-27.00R.

Millett, Dennis A. Pressurized water powered sanding device. 3,928,947, Cl. 51-170.00T.

Millmaster Onyx Corporation: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,929,990.

Mills, Edward: *See—*
Prewarski, Mike; and Mills, Edward, 3,929,284.

Mills, Kenneth R.: *See—*
Walton, Roger J.; and Mills, Kenneth R., 3,929,689.

Milne, Robert M., III: *See—*
Popick, Mitchell A.; Milne, Robert M., III; and Aggarwal, Suresh K., 3,930,209.

Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, to Nissin Shokuhin Kaisha, Ltd. Method of manufacturing quick-soluble gelatinized powdered grain. 3,930,029, Cl. 426-44.000.

Minami, Toshihiro: *See—*
Nakamura, Yoshimi; Minami, Toshihiro; Niina, Eizi; and Mizutani, Katuzi, 3,929,517.

Minchak, Robert J.: *See—*
Tucker, Harold; and Minchak, Robert J., 3,929,746.

Minegishi, Yutaka: *See—*
Arai, Haruhiko; and Minegishi, Yutaka, 3,929,663.

Minieri, Pasquale P., to Tenneco Chemicals, Inc. Preservatives for surface-coating compositions. 3,929,705, Cl. 260-29.6MN.

Minnesota Mining and Manufacturing Company: *See—*
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., 3,929,552.
Chapman, Harvey A., 3,929,419.
Keith, Roger H., 3,929,270.
Kirby, Russell B., Jr.; and Wing, Stephen C., 3,929,476.
Wood, Vernon E., 3,929,418.
Wood, William P., 3,929,420.

Mintech Corporation: *See—*
Hand, John W., 3,928,973.

Misencik, John J., to Westinghouse Electric Corporation. Ground fault interrupter with means protecting against a grounded neutral condition and with a test circuit for testing performance. 3,930,187, Cl. 317-18.00D.

Mitchell, Robert W.: *See—*
Welch, John A.; and Mitchell, Robert W., 3,929,948.

Mitsubishi Chemical Industries, Ltd.: *See—*
Akasaki, Masato; Takashima, Hiroshi; and Shibata, Kazuhiro, 3,930,018.
Inomata, Jihei; Hino, Seiichi; and Tani, Tatsuo, 3,929,914.
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,929,881.
Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, 3,929,963.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Iwamoto, Hideo, 3,930,195.

Mitsubishi Gas Chemical Co., Ltd.: *See—*
Urakami, Teizi, 3,929,578.
Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,929,966.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Abiko, Shiro; Yorihiro, Kazuo; Sugihara, Toshiyuki; and Hanawa, Masakazu, 3,929,618.
Mitsubishi Rayon Co., Ltd.: *See—*
Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, 3,929,728.
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.
Orito, Zen-Ichi; Uchida, Minoru; and Mori, Noriaki, 3,929,946.
Mitsugi, Koji: *See—*
Sano: Konosuke; and Mitsugi, Koji, 3,929,573.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Hidohira, Yoshihumi, 3,929,614.
Mitsui, Ryozo: *See—*
Goto, Kenji; and Mitsui, Ryozo, 3,928,966.
Miyakawa, Masami; Yoneyama, Masakazu; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Dispersion of silver halide developing agent with surface active polymers of maleic acid half esters. 3,929,485, Cl. 96-66.00R.
Miyasaka, Katsuhiko: *See—*
Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, 3,929,765.
Miyauchi, Hirokazu; and Matsubara, Hironaga, to Sumitomo Electric Industries, Ltd. Method of manufacturing a polyethylene composition containing an aging inhibitor. 3,929,724, Cl. 260-45.90R.
Miyoshi, T. Kenneth; Berthold, Cornelius E.; Stephens, Frank M., Jr.; and Schellinger, Alfred K., to Ferrovanadium Corporation N.I. Fusion-oxidation process for recovering vanadium and titanium from iron ores. 3,929,461, Cl. 75-30.000.
Mizobata, Satoshi: *See—*
Komo, Tetsuya; Mizobata, Satoshi; Ukaji, Rokuo; and Kamihigoshi, Tutomu, 3,929,920.
Mizuguchi, Shigeru: *See—*
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, 3,929,993.
Mizuki, Eiichi: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; Fujiwara, Tadahiro; and Tsuji, Nobuo, 3,929,481.
Mizushima, Haruo: *See—*
Hashizume, Astuo; Tsuzuki, Ryuichiro; and Mizushima, Haruo, 3,930,079.
Mizushiro, Ken: *See—*
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.
Mizutani, Katuzi: *See—*
Nakamura, Yoshimi; Minami, Toshihiro; Niina, Eizi; and Mizutani, Katuzi, 3,929,517.
Mizutani, Makoto: *See—*
Kimura, Ichiro; Sugiyama, Hironari; Takita, Kiyoshi; and Mizutani, Makoto, 3,929,452.
Mizutani, Masayoshi: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,930,060.
Mobil Oil Corporation: *See—*
Button, Harold O.; and Trimble, Robert A., 3,929,626.
Chang, Harry L.; Cook, Evin L.; and Burdyn, Ralph F., 3,929,190.
Nelson, Earnest E., 3,929,434.
Theissen, Robert J., 3,929,455.
Moersch, George W.; and Creger, Paul L., to Parke, Davis & Company. Tetramethylalkane derivatives. 3,929,897, Cl. 260-602.000.
Mohan, Manohar, to William F. Shepherd, Inc. Mechanical interlock device for a vending machine. 3,929,257, Cl. 221-152.000.
Molino, Angelo R. Duct joining means and apparatus for forming the same. 3,928,996, Cl. 72-129.000.
Molkerei J. A. Meggle, Milchindustrie: *See—*
Kuipers, Arie, 3,930,039.
Mollico, Roxie. Vehicle safety indicating apparatus. 3,930,225, Cl. 340-62.000.
Moni, Inc.: *See—*
Moser, Richard M., 3,929,038.
Monpetit, Louis A.; and Fournier, Daniel R. Electronic control systems for internal combustion engines. 3,929,108, Cl. 123-32.0EA.
Monsanto Company: *See—*
Anagnostopoulos, Constantine E.; and Wise, Raleigh W., 3,929,012.
Bak, Bruce S.; Deets, Gary L.; and Pokigo, Francis J., 3,929,722.
D'Amico, John Joseph, 3,929,857.
Hall, Claude E.; and Stalvey, Louis L., 3,929,701.
Hamm, Philip C.; and Schafer, David E., 3,929,450.
Rapko, John N.; and Crutchfield, Marvin M., 3,929,875.
Summers, Charles Gene, 3,929,855.
Monsanto Research Corporation: *See—*
Salyer, Ival O.; and North, Charles J., 3,929,939.
Montagne, Jean Bernard, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Elastomers associated with cords of radial tires at points close to and removed from beads. 3,929,539, Cl. 156-123.000.
Montalbano, Anthony P., to Ippolito, Madeline. Apparatus for destroying syringes and like articles. 3,929,295, Cl. 241-190.000.
Montecatini Edison S.p.A.: *See—*
Morero, Domenico; Montiglio, Ugo; Aspes, Pierfrancesco; and Basile, Giampiero, 3,929,978.
Venturello, Carlo, 3,929,827.
Montedison S.p.A.: *See—*
Gazzarrini, Franco; Aguzzi, Paolo; and Corsini-Mena, Adriana, 3,929,665.
Montgomery, Thomas M., to Ocean Drilling & Exploration Company. Method of retrieving anchors. 3,929,087, Cl. 114-206.00R.
Montiglio, Ugo: *See—*
Morero, Domenico; Montiglio, Ugo; Aspes, Pierfrancesco; and Basile, Giampiero, 3,929,978.
Moore, Albert Lloyd; and Tang, Walter Kwei-Yuan, to Du Pont de Nemours, E. I., and Company. Novel fluoroelastomers in powder form. 3,929,934, Cl. 260-884.000.
Moore Business Forms, Inc.: *See—*
Alsop, Derek J., 3,929,828.
Alsop, Derek J., 3,930,108.
Moore, Douglas R., to Chicago Musical Instrument Co. Multiplex harmony generator. 3,929,051, Cl. 84-1.170.
Moore, George L.: *See—*
Terrell, Ross C.; and Moore, George L., 3,930,013.
Morero, Domenico; Montiglio, Ugo; Aspes, Pierfrancesco; and Basile, Giampiero, to Montecatini Edison S.p.A. Process for preparing ferromagnetic chromium dioxide. 3,929,978, Cl. 423-607.000.
Mori Ironworks Company Limited: *See—*
Katagiri, Yoshiaki; Urayama, Takao; and Mori, Masaji, 3,929,546.
Mori, Masaji: *See—*
Katagiri, Yoshiaki; Urayama, Takao; and Mori, Masaji, 3,929,546.
Mori, Noriaki: *See—*
Orito, Zen-Ichi; Uchida, Minoru; and Mori, Noriaki, 3,929,946.
Moriguchi, Isao: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.
Morimoto, Akira: *See—*
Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,929,775.
Morisaki, Nobukazu, to Daido Metal Company, Ltd. Device for measuring the thicknesses of parts having an arcuate portion such as bearings and the like. 3,928,918, Cl. 33-172.00R.
Morita, Akiyoshi; and Enami, Tomotada, to Victor Company of Japan, Limited. Oscillator synchronization circuit in a television camera. 3,930,122, Cl. 178-69.5TV.
Moriya, Yoshio: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.
Morley, Richard E.; and Schelberg, Charles C., Jr. Data transfer and manipulation apparatus for industrial computer controllers. 3,930,233, Cl. 340-172.500.
Morozowich, Walter, to Upjohn Company, The. Substituted tolylesters of PGF_2G2a. 3,929,862, Cl. 260-468.00D.
Morrill, Elliott; and Miller, James E., to CPC International Inc. Dye composition and method of dyeing. 3,929,697, Cl. 260-17.4ST.
Morris, Cyril; and Topham, Arthur, to Imperial Chemical Industries Limited. Colouration process. 3,929,405, Cl. 8-39.000.
Morrison, Jimmie H. Divider and partition device for wire. 3,929,248, Cl. 220-19.000.
Morsbach, Martin; Johren, Paul; and Meuken, Hermann, to Goetzewerke. Spreader spring for piston rings. 3,929,342, Cl. 277-141.000.
Moser, Richard M., to Moni, Inc. Grinding machine and drive assembly therefor. 3,929,038, Cl. 74-810.000.
Mosher, Arthur Joseph; and Yingst, Donald Eugene, to Societe d'Assistance Technique pour Produits Nestle S.A. In situ production of meat like flavor in extruded porous food product. 3,930,045, Cl. 426-533.000.
Moss, George J.: *See—*
Greene, Michael L.; and Moss, George J., 3,929,015.
Motorola, Inc.: *See—*
Ambruoso, Pasquale, Sr., 3,929,023.
Davidson, Uryon S., deceased; Ajamie, Amil J., administrator; and Price, James B., 3,929,528.
Kuhn, Harry A., Jr., 3,930,169.
Ocken, Alfred G., Jr.; and Skoda, William G., 3,929,022.
Moynahan, Edward B.; Brunner, August H., Jr.; and Skreckoski, Gerald R., to GAF Corporation. Recovery of silver from silver salts. 3,929,466, Cl. 75-83.000.
Muecke, Thomas Wayne: *See—*
Graham, John Wayne; Muecke, Thomas Wayne; and Cooke, Claude Everett, Jr., 3,929,191.
Mueller, Johannes: *See—*
Bickel, Hans; and Mueller, Johannes, 3,929,779.
Mueller, Karl: *See—*
Holik, Herbert; and Mueller, Karl, 3,929,560.
Mueller, Wolfgang: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Sollberger, Urs; and Wolf, Rainer, 3,929,940.
Muller, Erwin: *See—*
Blahak, Johannes; Muller, Erwin; and Kleimann, Helmut, 3,929,863.
Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Circuit for measuring the rate of synchro rotation. 3,930,143, Cl. 235-150.200.
Muller, Heinz; and Szonn, Bodo, to Beiersdorf Aktiengesellschaft. Adhesive sheets and webs and process for their manufacture. 3,930,102, Cl. 428-354.000.

Muller, Jakob, to Ingenieurburo fur Maschinebau Jakob Muller. Method and apparatus for moving a knitting needle or the like of a shuttleless loom. 3,929,170, Cl. 139-124.00A.

Murakami, Kyoko: *See—*
Kurata, Takeo; Hayazaki, Tamotsu; and Murakami, Kyoko, 3,928,958.

Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, to Yamanouchi Pharmaceutical Co., Ltd. Process of producing semi-synthetic penicillin. 3,929,767, Cl. 260-239.100.

Muraoka, Yasuhiko: *See—*
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, 3,929,993.

Murata, Moriyasu: *See—*
Arai, Haruhiko; Tachibana, Kyozaburo; Naganuma, Yoshinori; and Murata, Moriyasu, 3,929,680.

Murata, Takao; Nakamura, Nobutaka; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Phenolic resin adhesives containing resorcinol, formaldehyde and an alkali metal carbonate. 3,929,695, Cl. 260-17.500.

Muro, Kajuro: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.

Murphy, Wesley T., to Vercon Products, Inc. Roof assemblies for building structures. 3,928,951, Cl. 52-92.000.

Murray, Donald W.; and Pattenden, Warren C., to Exxon Research & Engineering Co. Modified lithium soap grease. 3,929,651, Cl. 252-41.000.

Murty, Dasika R.: *See—*
Murty, Hari S.; Gara, Siva K.; and Murty, Dasika R., 3,929,981.

Murty, Hari S.; Gara, Siva K.; and Murty, Dasika R., to E. R. Squibb & Sons, Inc. Method for determining thyroid function. 3,929,981, Cl. 424-1.000.

Myers, George M.: *See—*
Sutko, Adolph A.; and Myers, George M., 3,929,388.

Myers, Henry F., to United States Steel Corporation. Method for controlling splashing resulting from the use of gas knives. 3,930,075, Cl. 427-349.000.

N.L. Industries, Inc.: *See—*
Granquist, William T., 3,929,622.

N. V. Bekaert S.A.: *See—*
Nijs, Marc, 3,929,226.

Nadeau, Victor Joseph: *See—*
Jakobsen, Karl Severin; and Nadeau, Victor Joseph, 3,929,956.

Nagano, Toshihiro: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Naganuma, Yoshinori: *See—*
Arai, Haruhiko; Tachibana, Kyozaburo; Naganuma, Yoshinori; and Murata, Moriyasu, 3,929,680.

Nagashima, Saburo: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,929,881.

Nagata, Wataru, to Shionogi & Co., Ltd. 3-Isochromanone derivatives. 3,929,834, Cl. 260-343.20R.

Nagazumi, Yasuo, to Nissan Motor Company Limited. Mounting device for shoulder harness type safety belt. 3,929,203, Cl. 180-82.00C.

Nagy, Edward John: *See—*
Orkin, Stanley S.; and Nagy, Edward John, 3,929,396.

Nahas, Nicholas C.: *See—*
Koh, Kwang K.; Pennington, Robert E.; Vernon, Lonnie W.; and Nahas, Nicholas C., 3,929,431.

Naito, Okito, to Kabushiki Kaisha Seikosha. Electronic timepiece. 3,928,959, Cl. 58-23.00R.

Najimian, Harry, Jr.: *See—*
Lambrecht, Ralph E.; and Najimian, Harry, Jr., 3,929,089.

Nakabayashi, Shigetoshi: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,929,966.

Nakagawa, Keizo: *See—*
Hara, Satoshi; Akino, Morio; and Nakagawa, Keizo, 3,929,298.

Nakagawa, Yunosuke; Inamoto, Yoshiaki; and Aigami, Koji, to Kao Soap Co., Ltd. Liquid detergent bleaching composition. 3,929,661, Cl. 252-103.000.

Nakajima, Tomio: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi: Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.

Nakakobo, Isojiro: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.

Nakamura, Chihiro: *See—*
Tanigawa, Shizuhiko; Kikuya, Satoshi; Yamazoe, Yoshinori; and Nakamura, Chihiro, 3,930,270.

Nakamura, Harutoki; and Yagi, Jun, to Matsushita Electric Industrial Co., Ltd. Auto exhaust control catalyst on silica cloth support. 3,929,671, Cl. 252-455.00R.

Nakamura, Ichiro: *See—*
Ichiryu, Ken; Shigeta, Masayuki; Nakamura, Ichiro; and Kajiwara, Toshiyuki, 3,928,994.

Nakamura, Nobutaka: *See—*
Murata, Takao; Nakamura, Nobutaka; and Saeki, Yukio, 3,929,695.

Nakamura, Shinji: *See—*
Yamahara, Takeshi; Deguchi, Takashi; and Nakamura, Shinji, 3,929,773.

Nakamura, Tadashi; and Hagiwara, Hisami, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing porous synthetic resin film and sheet. 3,929,950, Cl. 264-49.000.

Nakamura, Yoshimi; Minami, Toshihiro; Niina, Eizi; and Mizutani, Katuzi, to Kobe Steel Ltd. Process for producing a steel having a superb combination of high strength and substantial toughness. 3,929,517, Cl. 148-12.00F.

Nakanishi, Astuo: *See—*
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.

Nakanishi, Atsuo: *See—*
Izawa, Shinichi; Ozeki, Juro; Tanaka, Tsutomu; and Nakanishi, Atsuo, 3,929,930.

Nakao, Yukimichi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.

Nakazono, Ryuichi: *See—*
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.

Nalco Chemical Company: *See—*
DuBrow, Paul L.; and Frisque, Alvin J., 3,929,088.
Hoffmann, Karl H.; Anderson, Donald R.; and Allain, Ronald J., 3,929,673.
Miller, Richard C.; and Payne, Charles C., 3,930,063.
Werges, Darrell L., 3,929,421.

Narayanan, Venkatachala L.; and Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. (Oxadiazolyl) alkyl) benzimidazoles. 3,929,814, Cl. 260-302.00H.

Nasby, Robert D.; and Corll, James A. Ski boot cleaner. 3,929,345, Cl. 280-11.37E.

National Research Development Corporation: *See—*
Baker, Ian Martin; Beynon, John David Emrys; and Roberts, Peter Christopher Tudor, 3,930,065.

National Semiconductor Corporation: *See—*
Dobkin, Robert C., 3,930,172.
Hodge, Robin H., 3,930,114.

National Steel Corporation: *See—*
Cook, Henry S., 3,929,231.

Naude, Alwyn Petrus. Louvre system. 3,928,954, Cl. 52-473.000.

Nedeljkovic, Arsenije I., to Eagle-Picher Industries, Inc. Composition and method for electrostatic deposition of dry porcelain enamel frit. 3,930,062, Cl. 427-27.000.

Neeff, Rutger: *See—*
Krock, Friedrich Wilhelm; and Neeff, Rutger, 3,929,401.

Neely, James E., Jr., to PPG Industries, Inc. Tempering glass sheets by heat of sublimation. 3,929,442, Cl. 65-114.000.

Neiman, William T.: *See—*
Cann, Everett Douglas, 3,929,967.

Nelson, Earnest E., to Mobil Oil Corporation. Corrosion reduction of tanker vessel cargo compartments. 3,929,434, Cl. 55-68.000.

Nelson, Gerald V.; Youngblood, Douglas J.; and Colvert, James H., to Texaco Inc. Zeolitic catalytic cracking catalysts. 3,929,668, Cl. 252-455.00Z.

Nelson, Michael E.: *See—*
Perlis, Barry R.; and Nelson, Michael E., 3,929,480.

Nelson, William T., to Phillips Petroleum Company. Lead/chloride/alumina isomerization catalyst for gasoline. 3,929,623, Cl. 208-135.000.

Neri, Dorothy: *See—*
Engelman, Elaine Green; and Neri, Dorothy, 3,930,055.

Neumann, Henning: *See—*
Britschinn, Horst; Federer, Fritz; and Neumann, Henning, 3,928,879.

Neustroev, Leonid Sergeevich: *See—*
Ainbinder, Emmanuil Gershkovich; Kurilov, Georgy Vasilievich; and Neustroev, Leonid Sergeevich, 3,928,983.

Neuzil, Richard W.: *See—*
Rosback, Donald H.; and Neuzil, Richard W., 3,929,669.

New Process Industries, Inc.: *See—*
Benson, Glendon M., 3,928,974.

Newell, Isaac Laird: *See—*
Houlihan, William F., deceased; Newell, Isaac Laird; and La Cosse, Gerald E., 3,929,514.

Newell, Lawrence Hugh. Trailer crane with outrigger to crawler conversion. 3,929,204, Cl. 180-9.20C.

NGK Spark Plug Co., Ltd.: *See—*
Asano, Toshiyasu; and Sumi, Kazuyoshi, 3,929,496.

Nicholas, Keith Harlow; Ford, Ronald Alfred; and Beale, Julian Robert Anthony, to U.S. Philips Corporation. Semiconductor devices. 3,929,512, Cl. 148-1.500.

Nichparenko, John: *See—*
Yablonski, Michael E.; and Nichparenko, John, 3,929,124.

Nickell, Claude H. Compressor cycling unit. 3,928,984, Cl. 62-196.000.

Niederprum, Hans: *See—*
Rosendahl, Friedrich-Karl; Pelousek, Herbert; and Niederprum, Hans, 3,929,720.

Nield, Eric, to Imperial Chemical Industries Limited. Polymer compositions. 3,929,710, Cl. 260-30.80R.

Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of mainly linear aldehydes. 3,929,898, Cl. 260-604.0HF.

Niina, Eizi: *See—*
Nakamura, Yoshimi; Minami, Toshihiro; Niina, Eizi; and Mizutani, Katuzi, 3,929,517.

Nijs, Marc, to N. V. Bekaert S.A. Packing coils of wire netting. 3,929,226, Cl. 206-410.000.

Nikonenko, Dmitry Iosifovich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Niles, Earl Thomas, to Dow Chemical Company, The. Pyrotechnic disseminating formulation. 3,929,530, Cl. 149-84.000.

Ninagawa, Sadayoshi: *See—*
Inazuka, Shinichi; and Ninagawa, Sadayoshi, 3,929,819.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Deutsch, Ralph, 3,929,053.

Nippon Hard Facing Co., Ltd.: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.

Nippon Kayaku Co., Ltd.: *See—*
Hiroshi, Miyazakai; Kazuo, Kato; and Michinori, Koyama, 3,929,757.

Nippon Kayaku Kabushiki Kaisha: *See—*
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, 3,929,993.

Nippon Kogaku K.K.: *See—*
Maida, Osamu, 3,930,253.

Nippon Light Metal Co., Ltd.: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Nippon Oil Company Ltd.: *See—*
Sato, Hisatake, 3,929,736.

Nippon Soda Company, Ltd.: *See—*
Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, 3,929,903.

Nippon Steel Corporation: *See—*
Kinoshi, Masao; and Furumura, Kyozarburo, 3,929,523.
Okada, Hideya; and Shimada, Haruo, 3,929,472.

Nishi, Takeshi, Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, to Yawata Iron & Steel Co., Ltd.; Yawata Welding Electrode Co., Ltd.; and Nippon Hard Facing Co., Ltd. Wearing member having a pad-welded surface layer high in wear-resistance and heat crack-resistance. 3,929,428, Cl. 29-196.100.

Nishikawa, Tatsuo; and Asakura, Osamu, to Canon Kabushiki Kaisha. Impact printer. 3,929,067, Cl. 101-93.300.

Nishikawa, Yoichi: *See—*
Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, 3,930,141.

Nishikuri, Masao: *See—*
Yamada, Eiji; and Nishikuri, Masao, 3,929,842.

Nishimura, Seiichiro, to Bridgestone Tire Company Limited. Method and apparatus for finishing pneumatic tires. 3,929,043, Cl. 82-1.00C.

Nishina, Rintaro, to Tamura Electric Works, Ltd. Timer for controlling the operation of electrical devices. 3,930,131, Cl. 200-35.00R.

Nissan Motor Company Limited: *See—*
Nagazumi, Yasuo, 3,929,203.
Ogino, Michihiro, 3,929,392.
Ogura, Hisateru, 3,929,092.
Sukeshita, Kazumi, 3,929,030.

Nissen, Stanley M.: *See—*
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., 3,930,232.

Nissin Shokuhin Kaisha, Ltd.: *See—*
Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, 3,930,029.

Nistri, Ugo; Parodi, Antonio; and Vargiu, Silvio, to Societa' Italiana Resine S.I.R. S.p.A. Continuous process for the production of aminoplast moulding compositions. 3,929,696, Cl. 260-17.300.

Nitto Boseki Co., Ltd.: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Noah, Russell V., to Greer Hydraulics, Inc. Anti-bottoming fluid control system. 3,929,313, Cl. 251-28.000.

Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, to Nippon Soda Company, Ltd. Germicidal and fungicidal diphenyl ethers. 3,929,903, Cl. 260-613.00R.

Noray Unlimited, Inc.: *See—*
Gurman, Norman R., 3,928,921.

Norddeutsche Schleifmittel-Industrie Christiansen & Co.: *See—*
Wagner, Eckhard, 3,928,949.

Nordon Industries, Inc.: *See—*
Burzen, Norman J., 3,929,212.

Nordsiek, Karl-Heinz: *See—*
Berg, Gerhard; and Nordsiek, Karl-Heinz, 3,929,707.

Nordson Corporation: *See—*
Hastings, Donald R.; and Noss, Jeffrey S., 3,929,286.

Norman Lock Co.: *See—*
Epstein, Norman, 3,928,993.

Norose, Fumitaka: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.

Norsk Hydro A.S.: *See—*
Heimdal, Ivar Dagfinn; and Skreosen, Ivar, 3,929,263.

Norstrom, Lars-Ake: *See—*
Hellner, Lars Ivar; and Norstrom, Lars-Ake, 3,929,520.

North, Charles J.: *See—*
Salyer, Ival O.; and North, Charles J., 3,929,939.

North Electric Company: *See—*
Burens, James H.; and Wallace, Kenneth A., 3,930,170.

Northern Electric Company Limited: *See—*
Winter, James Douglas; and Elder, Mark Alexander, 3,930,208.

Noss, Jeffrey S.: *See—*
Hastings, Donald R.; and Noss, Jeffrey S., 3,929,286.

Notari, Bruno: *See—*
Buonomo, Franco; Fattore, Vittorio; Zanoni, Gianfranco; and Notari, Bruno, 3,929,681.

Nowell, Roger; and Tate, Philip Edward Russell, to Burmah Oil Trading Limited. An oil-based EDPM polymer composition in the form of a castable jelly and method of using same. 3,929,715, Cl. 260-33.6AQ.

Nowroski, Alvin P.: *See—*
Harrison, Robert S.; Medrick, John D.; and Nowroski, Alvin P., 3,929,942.

Noyes, Richard Croissant, to Combustion Engineering, Inc. Volume displacing modules for liquid metal cooled nuclear reactors. 3,929,566, Cl. 176-37.000.

NSM Apparatebau GmbH Kommanditgesellschaft: *See—*
Busch, Juergen Peter, 3,929,338.

Nussbaum, Ralph W.: *See—*
Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., 3,929,738.

Nuttall, Roy; and Rowbotham, Clifford, to Ferranti, Limited. Method of making semi-conductor devices utilizing a compensating prediffusion. 3,929,526, Cl. 148-175.000.

Oak Ridge Machines: *See—*
Picker, Franck, 3,928,969.

Oakley, Robert Lawford: *See—*
Ryden, Vernon John; and Oakley, Robert Lawford, 3,929,368.

Ocean Drilling & Exploration Company: *See—*
Montgomery, Thomas M., 3,929,087.

Ocken, Alfred G., Jr.; and Skoda, William G., to Motorola, Inc. Recessed meter in a housing and method of adjusting the same. 3,929,022, Cl. 73-431.000.

Offerman, Sidney, to Grow Chemical Corporation. Sprayable decorative coating composition for covering unfinished surfaces. 3,929,692, Cl. 260-7.500.

Ofuchi, Kunihiko: *See—*
Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, 3,929,963.

Ogino, Michihiro, to Nissan Motor Company Limited. Resilient bearing structure. 3,929,392, Cl. 308-26.000.

Ogura, Hisateru, to Nissan Motor Company Limited. Selector lever position indicator for motor vehicle automatic transmission system. 3,929,092, Cl. 116-124.00M.

Ohmura, Kaoru: *See—*
Komoto, Hiroshi; and Ohmura, Kaoru, 3,929,716.

Ohr, Jack; and Clark, Kenneth G., to United States of America, Navy. Solubilization of chromate salts in organic media. 3,929,521, Cl. 148-6.200.

Okabayashi, Ikuo: *See—*
Terashima, Osamu; and Okabayashi, Ikuo, 3,928,979.

Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Method for removing oxides of nitrogen from gaseous mixtures. 3,929,966, Cl. 423-239.000.

Okada, Hideya; and Shimada, Haruo, to Nippon Steel Corporation. Steel sheets having excellent rust resistance. 3,929,472, Cl. 75-124.000.

Okada, Taiiti: *See—*
Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,929,775.

Okada, Takao: *See—*
Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, 3,930,141.

Okamoto, Hiroshi Control system for a recording/reproducing apparatus. 3,930,266, Cl. 360-62.000.

Okano, Takeshi: *See—*
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,929,881.

Okazaki, Isao: *See—*
Shibata, Hiroshi; Kokubu, Yoshikazu; and Okazaki, Isao, 3,930,151.

Okuwaki, Akitsugu: *See—*
Okabe, Taijiro; Okuwaki, Akitsugu; and Nakabayashi, Shigetoshi, 3,929,966.

Oldfield, Lucy Florence, to General Electric Company Limited, The. Manufacture of laser glass. 3,929,440, Cl. 65-32.000.

Oldis, John Edward; and Venkatesan, Peruvemba Swaminatha, to Western Electric Company, Inc. Method of and apparatus for producing articles having high magnetic permeability from billets of temporarily magnetizable (i.e., soft magnetic) material. 3,928,995, Cl. 72-60.000.

Olin Corporation: *See—*
Cheskis, Harvey P.; Shapiro, Stanley; and Pryor, Michael J., 3,929,516.
Hodil, Elmer R., 3,929,269.
Laws, Harold H., 3,928,997.

Oliver, Steve. Method and apparatus for forming swimming pool gutters. 3,929,944, Cl. 264-34.000.

Olsen, Willi; and Lieske, Manfred, to Siemens Aktiengesellschaft. Completely insulated high-voltage switching system. 3,930,188, Cl. 317-103.000.

Olson, Lorin P., to Addressograph Multigraph Corporation. Document transport and registration apparatus. 3,929,327, Cl. 271-250.000.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Non-elastomeric polyurethane compositions containing cyclic ethers. 3,929,709, Cl. 260-30.40N.

Olympia Werke AG: *See—*
Sicking, Heinrich, 3,930,260.

Omark Industries, Inc.: *See—*
Graversen, Curtis L., 3,929,049.

O'Neill, Charles T.: *See—*
Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., 3,929,738.

Ontario Paper Company Limited, The: *See—*
Shaw, Alan C., 3,929,558.

Onton, Aare: *See—*
Guarnieri, C. Richard; Lee, Kenneth; and Onton, Aare, 3,930,241.

Organic Chemicals Company, Inc.: *See—*
Slikkers, George, Jr., 3,929,586.

Orito, Zen-Ichi; Uchida, Minoru; and Mori, Noriaki, to Mitsubishi Rayon Co., Ltd. Process for producing hygroscopic acrylic fibers. 3,929,946, Cl. 264-41.000.

Orkin, Stanley S.; and Nagy, Edward John, to Kamatics Corporation. Molded plastic bearing assembly. 3,929,396, Cl. 308-241.000.

Orlando, Charles M.; and Lavallee, Francois A., to General Electric Company. Brominated biphenols. 3,929,908, Cl. 260-620.000.

Orlowski, Jan A.: *See—*
Lee, Henry L.; Orlowski, Jan A.; and Butler, David V., 3,929,001
Lee, Henry L., Jr.; and Orlowski, Jan A., 3,929,493.

Orpwood, John Leonard: *See—*
Hudson, Alan George; and Orpwood, John Leonard, 3,929,698.

Orsino, Joseph A.: *See—*
Burkett, Wilford B.; and Orsino, Joseph A., 3,929,505.

Osbond, John Mervyn: *See—*
Fothergill, Graham Alwyn; Osbond, John Mervyn; and Wickens, James Charles, 3,929,836.

Osborne, Robert L., to Westinghouse Electric Corporation. System and method for improved steam turbine operation. 3,928,972, Cl. 60-646.000.

Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, to Takeda Chemical Industries, Ltd. Process for producing cephalosporin derivatives. 3,929,775, Cl. 260-243.00C.

Oswald, Alexis A., to Exxon Research & Engineering Co. Tetraalkyl phosphonium aluminosilicates. 3,929,849, Cl. 260-448.00C.

Ota, Hiroyuki: *See—*
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.

Ott, Joseph D. Mount for pair of ski boots on single snow ski. 3,929,344, Cl. 280-11.35C.

Otto, Bernhard: *See—*
Lotz, Horst K.; and Otto, Bernhard, 3,929,324.

Outboard Marine Corporation: *See—*
Lambrecht, Ralph E.; and Najimian, Harry, Jr., 3,929,089.
Turner, Robert K.; and Rose, Edgar, 3,929,111.

Overbeek, Gerhardus: *See—*
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, 3,929,469.

Owens-Illinois, Inc.: *See—*
Gray, Don N.; and Guilbault, George G., 3,929,609.
Grier, John D., 3,929,070.
Veres, Frank, 3,929,494.

Oxy Metal Industries Corporation: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.

Oyama, Yoshishige: *See—*
Yamauti, Teruo; Oyama, Yoshishige; and Hohsho, Yukio, 3,929,115.

Ozark-Mahoning Company: *See—*
Meshri, Dayal T.; White, Wayne E.; and Sowell, Charles L., 3,929,918.

Ozeki, Juro: *See—*
Izawa, Shinichi; Ozeki, Juro; Tanaka, Tsutomu; and Nakanishi, Atsuo, 3,929,930.
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.

P. R. Mallory & Co., Inc.: *See—*
Bro, Per; Kelsey, Robert H.; and Marincic, Nikola, 3,929,507.
Krock, Richard H.; and Pickett, Jerome J., 3,929,424.

Paccagnella, Danilo. Apparatus for folding and pressing an edge of pliant material. 3,929,547, Cl. 156-443.000.

Pachter, Irwin J.: *See—*
Fliedner, Leonard J., Jr.; and Pachter, Irwin J., 3,929,887.

Paddock, Paul F.; and Cramer, Jerry W., to Sunkist Growers, Inc. Means to guide a layer of objects into a box. 3,928,942, Cl. 53-247.000.

Pagdin, Brian Colin, to GKN Transmissions Limited. Fuel injection apparatus for internal combustion engines. 3,929,112, Cl. 123-139.0BC.

Pageau, Lucien: *See—*
Thayer, William; Pageau, Lucien; and Sourirajan, Srinivasa, 3,929,945.

Paine, Robert T., Jr.: *See—*
Asprey, Larned B.; and Paine, Robert T., Jr., 3,929,601.

Palmer, Richard Claxton: *See—*
Clemens, Jon Kaufmann; and Palmer, Richard Claxton, 3,930,117.

Palsson, Jan, to AB Ziristor. Arrangement for the feeding and cutting off of a packing material web. 3,929,045, Cl. 83-323.000.

Pamer, Karl A., to McNeil Corporation. Article storage facility. 3,929,229, Cl. 211-134.000.

Pandey, Raghvendra K., to Cincinnati Electronics Corporation. Nucleating growth of lead-tin-telluride single crystal with an oriented barium fluoride substrate. 3,929,556, Cl. 156-611.000.

Panico, C. Richard, to Xenon Corporation. Inner electrode-support seal for a gaseous discharge flashtube. 3,930,176, Cl. 313-220.000.

Papenfuss, Theodor, to Hoechst Aktiengesellschaft. Process for preparing 4-hydroxy-3-nitrobenzoic acid alkyl esters. 3,929,864, Cl. 260-471.00R.

Pariso, Pasquale P. Float valve. 3,929,156, Cl. 137-444.000.

Park, John N.; Steigerwald, Robert L.; and Walker, Loren H., to General Electric Company. Bridge rectifier circuits using transistors as rectifying elements. 3,930,196, Cl. 321-47.000.

Parke, Davis & Company: *See—*
Creger, Paul L., 3,930,024.
Holmes, Ann; and Meyer, Robert F., 3,929,856.
Moersch, George W.; and Creger, Paul L., 3,929,897.

Parker, Frederick A.; and Mac Bride, William R., to Biomarine Industries, Inc. Method of and apparatus for determining the oxygen content of blood. 3,929,588, Cl. 204-1.00T.

Parker-Hannifin Corporation: *See—*
Lopez, Manuel; and Bourassa, Joseph R., 3,928,887.

Parker, James Eric; and Hill, Nigel, to Dowty Mining Equipment Limited. Mine proof support. 3,928,981, Cl. 61-45.00D.

Parker, Roy B., to United States of America, Navy. Process for dyeing of novoloid fibers. 3,929,407, Cl. 8-168.000.

Parkinson, Christopher: *See—*
Griffith, Robert M.; and Parkinson, Christopher, 3,929,629.

Parkinson, John K.; and Ruhe, Anthony. Ultrasonic inspection recess in heat exchanger and nuclear steam generator tubesheets. 3,929,005, Cl. 73-67.800.

Parmann, Gunnar, to Rieber & Son Plastic-Industri A/S. Process for producing radially-expanded socket ends on thermoplastic pipe lengths. 3,929,958, Cl. 264-249.000.

Parodi, Antonio: *See—*
Nistri, Ugo; Parodi, Antonio; and Vargiu, Silvio, 3,929,696.

Parrish, Donald B.: *See—*
Olstowski, Franciszek; and Parrish, Donald B., 3,929,709.

Parry, David Rees, to Imperial Chemical Industries Limited. Pyrimidinyl acetic acid derivatives and processes for their production. 3,929,789, Cl. 260-256.40C.

Parsons, Gary L.: *See—*
Turner, James Keith; and Parsons, Gary L., 3,929,639.

Parsons, J. Hilton, Jr : *See—*
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., 3,929,543.

Parthasarathy, R.; and Scherzer, Julius, to W. R. Grace & Co. Hydrocracking catalyst and process. 3,929,620, Cl. 208-111.000.

Parvi, Ludovic: *See—*
Isard, Arsene; and Parvi, Ludovic, 3,929,886.

Pasini, Franco, to Industrie Pirelli S.p.A. Mixed fluid impregnant for oil filled electric cables. 3,930,112, Cl. 174-25.00C.

Pasiuk, Walter T., to United States of America, Army. Preparation of thermal barriers. 3,930,085, Cl. 428-116.000.

Paton, Charles R.: *See—*
Richards, Edward L.; Paton, Charles R.; and Rooney, Daniel G., 3,930,214.

Pattenden, Warren C.: *See—*
Murray, Donald W.; and Pattenden, Warren C., 3,929,651.

Patterson, Frank Knowles, to Du Pont de Nemours, E. I., and Company. Boride-containing metallizations. 3,929,674, Cl. 252-514.000.

Patzke, Jorg: *See—*
Kratel, Gunter; Patzke, Jorg; and Wegehaupt, Karl-Heinrich, 3,929,718.

Paul, Terence Barrington. Diver's breathing apparatus with gas purifying system. 3,929,127, Cl. 128-142.000.

Paustian, John E.: *See—*
Gelbein, Abraham P.; Sze, Morgan C.; and Paustian, John E., 3,929,811.

Pavey, George M., Jr., to Whitehall Corporation. Seismic streamer construction for minimizing hydrophone response to vibration produced pressure fields. 3,930,254, Cl. 340-7.00R.

Payne, Charles C.: *See—*
Miller, Richard C.; and Payne, Charles C., 3,930,063.

PB Gelatines: *See—*
De Brou, Michel; and Den Tandt, Claude, 3,930,052.

Pease, James F. Electrical heating element and fitting assembly. 3,930,140, Cl. 219-316.000.
Pech, Bernard M., to Societe Nationale des Poudres et Explosifs. Safety device with an inflatable cushion, especially for automobiles. 3,929,350, Cl. 280-150.0AB.
Peckham, Victor A., Jr. Bicycle power brake. 3,929,209, Cl. 188-24.000.
Pecorella, Saviour S., to Becton, Dickinson and Company. Disposable thermometer. 3,929,021, Cl. 73-356.000.
Pedersen, Nicholas F.: *See—*
Becker, Kenneth F.; and Pedersen, Nicholas F., 3,928,968.
Peham, Engelbert J. Bracket for supporting an ornament. 3,929,310, Cl. 248-226.00E.
Peisker, Glenn W., to Chicago Rawhide Manufacturing Company. Seal with pumping action. 3,929,340, Cl. 277-134.000.
Pekkarinen, Michael O., to Baxter Laboratories, Inc. Disposable humidifier. 3,929,128, Cl. 128-194.000.
Pelousek, Herbert: *See—*
Rosendahl, Friedrich-Karl; Pelousek, Herbert; and Niederprum, Hans, 3,929,720.
Pennington, Robert E.: *See—*
Koh, Kwang K.; Pennington, Robert E.; Vernon, Lonnie W.; and Nahas, Nicholas C., 3,929,431.
Pennsylvania Crusher Corporation: *See—*
Hahn, William F.; and Graf, Carl R., 3,929,293.
Pennwalt Corporation: *See—*
Kydonieus, Nicholas; and Sandler, Stanley Robert, 3,929,852.
Penoli, Raymond J., Jr.: *See—*
Gaul, Ray A.; and Penoli, Raymond J., Jr., 3,928,991.
Pepro, Societe pour le Developement et la Vent de Specialities: *See—*
Pillon, Daniel; Ducret, Jacques; and Demozay, Daniel, 3,929,805.
Perfection Manufacturing Company, The: *See—*
Boyer, Walter J., 3,928,956.
Perkins, Norwood K.: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.
Perl, Richard L., to Tappan Company, The. Gas igniter. 3,928,910, Cl. 29-628.000.
Perlis, Barry R.; and Nelson, Michael E., to Dennison Manufacturing Company. Continuous tone ZnO - acrylic polymer binder and additive. 3,929,480, Cl. 96-1.800.
Perrella, Donald J.; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Bis-cephalosporine. 3,929,777, Cl. 260-243.00C.
Perry, Ernest John: *See—*
Ponticello, Ignazio Salvatore; and Perry, Ernest John, 3,929,482.
Perry, Robert E. Automatic shift control for bicycles and the like. 3,929,025, Cl. 74-217.00B.
Persson, Sture Ivan. Throw-away receptacle for collection of urine of those confined to bed. 3,928,875, Cl. 4-110.000.
Peters, Franciscus J. W. M.; Middelhoek, Servaas; and Rijkeboer, Albert, to Billiton Research B. V. Process for the preparation of vanadium, vanadium alloys or vanadium compounds. 3,929,460, Cl. 75-24.000.
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Crease resistant cellulosic textile material. 3,930,087, Cl. 428-278.000.
Peterson, Brent L. Modulating compression release for an engine. 3,929,116, Cl. 123-182.000.
Peterson, Henry G.; and Grimes, Tom, to Roto Rooter Corporation. Pipe cleaning machine and cable retrieving mechanism therefor. 3,928,885, Cl. 15-104.3SN.
Petitpierre, Jean Claude: *See—*
Garner, Robert; and Petitpierre, Jean Claude, 3,929,831.
Petr, Vlastimil: *See—*
Rosa, Josef; and Petr, Vlastimil, 3,929,417.
Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,929,990.
Petroff, Guy, to Hinderstein, Philip M. Lock for sliding doors and windows. 3,929,362, Cl. 292-291.000.
Petrolite Corporation: *See—*
Buriks, Rudolf S.; and Fauke, Allen R., 3,929,632.
Buriks, Rudolf S.; and Fauke, Allen R., 3,929,635.
Lucas, Roy N., 3,929,625.
Petrov, Gennady Nikolaevich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.
Petrov, Georgi Mitov; Iliev, Iliya Marinov; and Ilov, Rangel Georgiev, to DSO "Textil". Method of and device for shaped effect yarns with or without ladders. 3,928,957, Cl. 57-18.000.
Petynia, William W.: *See—*
Faget, Maxime A.; Petynia, William W.; and Taub, Willard M., 3,929,306.
Pfarrwaller, Erwin, to Sulzer Brothers Limited. Thread brake. 3,929,169, Cl. 139-122.00H.
Pfefferle, William C., to Engelhard Minerals & Chemicals Corporation. Catalytically-supported thermal combustion. 3,928,961, Cl. 60-39.020.
Pfeiffer, Hans Christian, to International Business Machines Corporation. Lens and deflection unit arrangement for electron beam columns. 3,930,181, Cl. 313-421.000.
Pfister, Bernard, to Union Laitiere Vaudoise. Process for the preparation of a hydrolyzate of proteins for use as a foodstuff. 3,929,890, Cl. 426-580.000.
Pfizer Inc.: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,930,004.
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,929,818.
Holland, Gerald F., 3,929,803.
Koch, Richard C., 3,930,001.
Richards, Hugh Colin, 3,929,784.
Pfrengle, Otto: *See—*
Ladisch, Gerhard, 3,929,291.
Philadelphia Quartz Company: *See—*
Pierce, Richard H., 3,929,439.
Phillips, Lyle C., to Henderson Manufacturing Co. Apparatus for synchronizing the rotational speeds of a pair of independently driven reversely rotatable shafts. 3,929,292, Cl. 239-685.000.
Phillips Petroleum Company: *See—*
Brady, Donnie G.; and Bailey, Fay W., 3,929,708.
Chapman, Charles C., 3,929,924.
Chapman, Charles; C., 3,929,925.
Dixon, Rolland E., 3,929,430.
Drake, Charles A., 3,929,860.
Harper, Ernest A.; and Bailey, Dunn M., 3,929,438.
Nelson, William T., 3,929,623.
Short, James N., 3,930,078.
Spears, Johnnie E.; and Caldwell, Donald L., 3,929,541.
Walton, Roger J.; and Mills, Kenneth R., 3,929,689.
Wiley, Bruce F., 3,930,217.
Phillips, Wendell, to Robert Manufacturing Company. Backflow preventor for automatic dishwashers. 3,929,149, Cl. 137-216.000.
Picandet, Jean A., to Jeumont-Schneider. Connection network for a time switching automatic electronic exchange. 3,930,125, Cl. 179-15.0AQ.
Picker, Franck, to Oak Ridge Machines. Self-monitored fluid pressure booster system. 3,928,969, Cl. 60-428.000.
Pickett, Jerome J.: *See—*
Krock, Richard H.; and Pickett, Jerome J., 3,929,424.
Pico, Francisco A. Conveyor belt idler rollers. 3,929,391, Cl. 308-20.000.
Piepers, Gijsbrecht Gerhardus; and Vons, Leonard Hendrik, to Reactor Centrum Nederland. Plate spring or retaining grid for a bunch cylindrical elements engaged in a heat exchange process. 3,929,569, Cl. 176-78.000.
Pierce, Louis B.: *See—*
De Vore, Ellen G., 3,929,309.
Pierce, Richard H., to Philadelphia Quartz Company. Method for preparing a highly siliceous alkali metal silicate glass and hydrated powder. 3,929,439, Cl. 65-22.000.
Pike, John E.; and Schneider, William P., to Upjohn Company, The. 16- and 16,16-methyl and ethyl substituted PGF_1-type compounds. 3,929,861, Cl. 260-468.00D.
Pillon, Daniel; Ducret, Jacques; and Demozay, Daniel, to Pepro, Societe pour le Developement et la Vent de Specialities. Certain 4H-(2,3d)pyrido-1,3,2-dioxaphosphorinanes. 3,929,805, Cl. 260-294.80C.
Pillon, Marcel Octave, to Pont-A-Mousson S.A. Machine for printing stamps, in particular on bottle caps. 3,929,066, Cl. 101-35.000.
Pinkham, Philip C., to Litton Systems, Inc. Keyboard panel for an electric switch contact. 3,930,083, Cl. 428-67.000.
Piribauer, Herbert: *See—*
Fidi, Werner; and Piribauer, Herbert, 3,930,128.
Pisarev, Georgy Lvovich: *See—*
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; Judin, Alexandr Nikolaevich; Pisarev, Georgy Lvovich; and Roslyakov, Vladimir Yakovlevich, 3,929,110.
Pissiotas, Georg: *See—*
Durr, Dieter; and Pissiotas, Georg, 3,929,883.
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, to Swarsab Mining, Exploration & Development Company (Proprietary) Limited. Separation and purification of gold. 3,929,469, Cl. 75-108.000.
Pittinger, Charles B., Jr. Hollow-shaft feed filament trimmer. 3,928,911, Cl. 30-276.000.
Pitts, Robert W., Jr., to Texaco Inc. System for measuring earth formation thermal neutron lifetime utilizing a harmonically intensity modulated fast neutron source. 3,930,152, Cl. 250-269.000.
Plener, Helmut, to Uher Werke Munich. Push button release control system for a tape recorder. 3,930,267, Cl. 360-69.000.
Plumb, John Beckett: *See—*
Atherton, John Heathcote; Plumb, John Beckett; and Stuart, Ronald Sangster, 3,929,851.
Plumberg, Leonard G., to Funck, Donald E. Automatic tamper alarm for motor vehicles. 3,930,226, Cl. 340-64.000.
Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Ganzinotti, Jean Victor, 3,928,980.
Poisson, Pierre: *See—*
Bernier, Cecile; Jouhaneau, Monique; and Poisson, Pierre, 3,929,734.
Pokigo, Francis J.: *See—*
Bak, Bruce S.; Deets, Gary L.; and Pokigo, Francis J., 3,929,722.
Polaroid Corporation: *See—*
Bader, Henry; and Jahngen, Edwin G., Jr., 3,929,848.
Biber, Conrad H.; and Shenk, Edwin K., 3,930,184.

Borror, Alan L.; and Garcia, Paulina P., 3,929,797.
Borror, Alan L., 3,929,829.
Rickter, Donald O., 3,929,786.
Williamson, Richard P., Jr., 3,930,198.

Poling, Stephen M.: *See—*
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,037.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,038.

Polychrome Corporation: *See—*
Chu, Simon Long; and Shimazu, Ken-Ichi, 3,929,591.

Polymer Research Corporation of America: *See—*
Horowitz, Carl, 3,929,800.

Pont-A-Mousson S.A.: *See—*
Pillon, Marcel Octave, 3,929,066.

Ponticello, Ignazio Salvatore; and Perry, Ernest John, to Eastman Kodak Company. Hardenable vehicles for silver halide emulsions. 3,929,482, Cl. 96-114.000.

Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, to Boehringer Mannheim G.m.b.H. Certain piperazine-containing indole compounds. 3,929,793, Cl. 260-268.0BC.

Popick, Mitchell A.; Milne, Robert M., III; and Aggarwal, Suresh K., to General Signal Corporation. Transmission line simulator. 3,930,209, Cl. 333-23.000.

Poponiak, Michael R., to International Business Machines Corporation. Method for gettering contaminants in monocrystalline silicon. 3,929,529, Cl. 148-191.000.

Porter, Joe A., to Uniloc, Inc. Electrolytic sensor with pressure compensating means. 3,929,603, Cl. 204-195.00P.

Potts, James E.: *See—*
Clendinning, Robert A.; Potts, James E.; and Gorham, William F., 3,929,937.

Pout, Christopher Ronald: *See—*
Davies, Evan Ellis; and Pout, Christopher Ronald, 3,929,624.

Powel International Limited: *See—*
Powel, William Roy, 3,929,220.

Powel, William Roy, to Powel International Limited. Pallet conveyor having relatively adjustable pusher heads. 3,929,220, Cl. 198-164.000.

PPG Industries, Inc.: *See—*
Frank, Robert G., 3,929,441.
May, Earl L.; and Fisher, Joseph J., 3,929,444.
Mazzoni, Renato J.; Bowser, George H.; and Stewart, John L., 3,928,953.
Neely, James E., Jr., 3,929,442.

Preston Metal and Roofing Products Limited: *See—*
Beynon, John O., 3,928,950.

Prewarski, Mike; and Mills, Edward. Programmable timer mechanism. 3,929,284, Cl. 236-46.000.

Price, Andrea A.: *See—*
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,970.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,976.

Price, James B.: *See—*
Davidson, Uryon S., deceased; Ajamie, Amil J., administrator; and Price, James B., 3,929,528.

Procter, Alan R., to MacMillan Bloedel Limited. Stabilization of cellulosic material by treatment with ferricyanide ion. 3,929,559, Cl. 162-70.000.

Procter & Gamble Company, The: *See—*
Baugher, William Lewis, 3,930,046.
Japikse, Cornelis Hendrikus; Singh, Gyanendra; and Kennedy, Timothy J., 3,930,053.
Laughlin, Robert Gene; and Heuring, Vincent Paul, 3,929,678.
Thompson, Hugh Ansley, 3,929,135.

Products Chimiques Ugine Kuhlmann: *See—*
Isard, Arsene; and Parvi, Ludovic, 3,929,886.

Proler, Sam. Method employing barrier means to submerge particles in a molten metal stream. 3,929,465, Cl. 75-65.00R.

Prosdocimo, Giordano: *See—*
Brusadin, Giacomo; and Prosdocimo, Giordano, 3,929,288.

Pryor, Michael J.: *See—*
Cheskis, Harvey P.; Shapiro, Stanley; and Pryor, Michael J., 3,929,516.

Puckett, Brian C. Fastener. 3,928,896, Cl. 24-224.000.

Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, to Ciba-Geigy Corporation. Process for the bulk-dyeing of linear polyesters. 3,929,719, Cl. 260-40.00P.

Putnam, Alvin A., to H. B. Zachry Co. Transport rig. 3,929,241, Cl. 214-390.000.

PVO International Inc.: *See—*
Bernholz, William F., 3,929,699.

Pyne, Bernard; and Liddle, Robert, to Timex Corporation. Watch strap with plastic clip. 3,929,265, Cl. 224-4.00D.

Quaintance, Harold J.: *See—*
Wainer, Eugene; and Quaintance, Harold J., 3,929,483.

Quaker City Gear Works, Inc.: *See—*
Sulzer, Harry E., 3,930,133.

Quang, Pham Kim; and Gasdoue, Rene, to La Cellophane. Methods of and apparatus for electrostatic printing. 3,930,257, Cl. 346-74.0ES.

Quebedeaux, Bruno, Jr.: *See—*
Beyer, Elmo M., Jr.; and Quebedeaux, Bruno, Jr., 3,929,447.

Queisser, Rudolf; and Schlossbauer, Hubert, to Siemens Aktiengesellschaft. Method and apparatus for inserting additional data between data previously stored in a store. 3,930,234, Cl. 340-172.500.

R. P. Cargille Laboratories, Inc.: *See—*
Bautis, Arthur N., 3,929,667.

Ragab, Mohamed Ismail, to International Pregnancy Advisory Services. Apparatus for removing, washing and displaying fragmentary products of operative procedures. 3,929,133, Cl. 128-277.000.

Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; Judin, Alexandr Nikolaevich; Pisarev, Georgy Lvovich; and Roslyakov, Vladimir Yakovlevich. Lubrication system of a two-stroke internal combustion engine. 3,929,110, Cl. 123-73.0AD.

Ralston Purina Company: *See—*
Kealy, Richard D., 3,930,031.

Ramachandran, Kolar S.: *See—*
Kumar, Surinder; and Ramachandran, Kolar S., 3,930,058.

Ramanathan, Visvanathan, to Ciba-Geigy AG. Polycyclic N-hetero dyestuffs. 3,929,785, Cl. 260-248.0AS.

Ramsden, Hugh E.: *See—*
De Simone, Robert S.; and Ramsden, Hugh E., 3,929,904.

Randleman, Patrick L.: *See—*
Young, Robert R.; Randleman, Patrick L.; and Stolins, Arthur B., 3,929,413.

Randolph, Jack R.: *See—*
Gregory, Joseph J.; and Randolph, Jack R., 3,928,883.

Ranks Hovis McDougall Limited: *See—*
Wookey, Norman; Jackson, Arthur Frederick; Collins, Michael Clive; and Francis, Brian, 3,930,048.

Ransburg Corporation: *See—*
Scharfenberger, James A., 3,930,061.

Rantanen, Uuno. Ice auger. 3,929,196, Cl. 175-18.000.

Rao, V. Durga Nageswar; and Telang, Yeshwant P., to Ford Motor Company. Process for coating the rubbing surfaces of the seal of the gas turbine regenerator. 3,930,071, Cl. 427-203.000.

Raoul, Pierre: *See—*
Thomas, Jean-Claude; Raoul, Pierre; and Ledoux, Claude, 3,929,100.

Rapko, John N.; and Crutchfield, Marvin M., to Monsanto Company. Ethanetetracarboxylate perhydrates. 3,929,875, Cl. 260-537.00R.

Rappoport, Leonid Yakovlevich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.

Rathgeb, Paul; Vogel, Christian; and Weiss, Anton G., to Ciba-Geigy Corporation. Herbicidal thiadiazolyl-ureas. 3,929,816, Cl. 260-306.80D.

Rauch, Francis Clyde; Fanelli, Anthony Joseph; and Blank, Gerlinde Metzler, to American Cyanamid Company. Process for the mononitration of ortho-xylene. 3,929,917, Cl. 260-645.000.

Rauch, Francis Clyde: *See—*
Levy, Stephen David; and Rauch, Francis Clyde, 3,929,916.

Rauner, Frederick J.: *See—*
Arcesi, Joseph A.; and Rauner, Frederick J., 3,929,489.

Ravet, Georges; and Chaux, Jean-Bernard, to Soprosoie. Process for dyeing textile materials based on polyamide. 3,929,408, Cl. 8-169.000.

Raymond Lee Organization, Inc., The: *See—*
Coleman, Arthur, 3,929,143.

Raytheon Company: *See—*
McLeod, Willard W., Jr.; and Heaton, John F., 3,930,238.
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., 3,930,232.

Razdan, Raj Kumar: *See—*
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,929,835.

RCA Corporation: *See—*
Barkow, William Henry; and Gross, Josef, 3,930,185.
Blust, Henry Leo; Lindburg, Norman Lee; and Henry, Dale Vernon, 3,929,426.
Clemens, Jon Kaufmann; and Palmer, Richard Claxton, 3,930,117.
Hawrylo, Frank Zygmunt, 3,929,525.
Kuzminski, Henry William, 3,929,532.
Rosen, Arye; and Reynolds, James Francis, 3,930,206.

Reactor Centrum Nederland: *See—*
Piepers, Gijsbrecht Gerhardus; and Vons, Leonard Hendrik, 3,929,569.

Read, George D., to Ajax Hardware Corporation. V-rail and drawer mounting system therewith. 3,929,386, Cl. 308-3.600.

Reagents of the University of Minnesota, The: *See—*
Hsiao, Chih C., 3,930,167.

Reese, Robert O., to Time Computer, Inc. Combination wristwatch and calculator. 3,928,960, Cl. 58-152.00R.

Reeves, Jerry H.: *See—*
Bolling, Robert W.; and Reeves, Jerry H., 3,929,275.

Reichhold Chemicals, Inc.: *See—*
Weymann, Henry P.; and Korose, John, 3,929,703.
White, Raymond Hadley; and Hill, Fredric Martin, 3,929,938.

Reifers, Richard F., to Diamond International Corporation. Method of molding free dried pulp display tray. 3,929,564, Cl. 162-224.000.

Reimuller, Christian J.: *See—*
Sheelor, Albert P., 3,930,111.

Reinhold, Donald F., to Merck & Co., Inc. Producing 3-fluoro-D-alanine. 3,929,576, Cl. 195-30.000.

Reis, John P., to Amity Leather Products Co. Pass case. 3,929,177, Cl. 150-35.000.

Reishauer AG.: *See—*
Wirz, Walker, 3,928,943.

Reiss, Karl-Hans, to Siemens Aktiengesellschaft. Matrix-form radiation image converter. 3,930,162, Cl. 250-385.000.

Reiter, Ralph H.; and Rosen, George, to Sun Chemical Corporation. Photopolymerizable compositions with polymeric initiators. 3,929,490, Cl. 96-115.00P.

Renger, Udo, to Volkswagenwerk Aktiengesellschaft. Reciprocating piston internal combustion engine. 3,929,107, Cl. 123-32.00B.

Repa Feinstanzwerk GmbH: *See—*
Klink, Wolf-Dieter, 3,928,895.

Research Corporation: *See—*
Roy, Della M., 3,929,971.

Research Engineering Co.: *See—*
Sheesley, John M.; and Gulick, Ronald A., 3,929,024.

Reuss, Guenter: *See—*
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, 3,930,087.

Reuter, Guido; and Robertz, Hans, to Rheinstahl Aktiengesellschaft. Apparatus for producing blank metal ingots of uniform cross section and in particular steel ingots. 3,929,184, Cl. 164-309.000.

Reynolds, James Francis: *See—*
Rosen, Arye; and Reynolds, James Francis, 3,930,206.

Reynolds Metals Company: *See—*
Kibby, Robert M., 3,929,456.

Rhea, Charles K., Jr.: *See—*
Byrne, John A.; and Rhea, Charles K., Jr., 3,929,277.

Rheinische Braunkohlenwerke AG: *See—*
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, 3,929,955.

Rheinstahl Aktiengesellschaft: *See—*
Held, Gerhard; and Balle, Walter, 3,929,540.
Reuter, Guido; and Robertz, Hans, 3,929,184.

Rhodia, Inc.: *See—*
De Simone, Robert S.; and Ramsden, Hugh E., 3,929,904.

Rhone-Poulenc, S.A.: *See—*
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 3,930,105.
Cronenberger, Michel; Laurent, Serge; and Mallet, Maurice, 3,930,070.
David, Reginald; and Estienne, Jean, 3,929,870.
Gruffaz, Max; and Rollet, Bernard, 3,929:687.
Michelet, Daniel, 3,929,613.

Rhone-Progil: *See—*
Thomas, Jean-Claude; Raoul, Pierre; and Ledoux, Claude, 3,929,100.

Ribka, Joachim: *See—*
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, 3,929,740.

Rice Barton Corporation: *See—*
Horne, Frederick H., 3,929,941.

Richards, Edward L., to Westinghouse Electric Corporation. Manually operable circuit interrupter with automatic current overload protection. 3,930,213, Cl. 337-70.000.

Richards, Edward L.; Paton, Charles R.; and Rooney, Daniel G., to Westinghouse Electric Corporation. Pushbuiton electric switch with reset mechanism. 3,930,214, Cl. 337-72.000.

Richards, Hugh Colin, to Pfizer Inc. 2-Aminoalkyl tetrahydroquinolines. 3,929,784, Cl. 260-247.5GP.

Richards, Theodore W. Electric outlet face plates or covers. 3,930,116, Cl. 174-66.000.

Richardson, Bart D.; and Waggoner, Michael L., to Atlantic Richfield Company. Method of making a double-walled pipe assembly. 3,928,903, Cl. 29-407.000.

Richardson, Donald M.: *See—*
Bamberger, Carlos E.; Richardson, Donald M.; and Grimes, Warren R., 3,929,979.

Richardson-Merrell Inc.: *See—*
Albrecht, William L.; and Fleming, Robert W., 3,929,802.
Webb, Norval Ellsworth, Jr., 3,929,985.

Richter, Harold J. Fluid transfer umbilical assembly for use in zero gravity environment. 3,929,164, Cl. 138-120.000.

Richter, Sidney B.; and Levin, Alfred A., to Velsicol Chemical Corporation. N-(α-thiocyanoacetyl)indolines. 3,929,830, Cl. 260-326.100.

Rickter, Donald O., to Polaroid Corporation. S-substituted hydropyrimidine compounds. 3,929,786, Cl. 260-251.00A.

Rieber & Son Plastic-Industri A/S: *See—*
Parmann, Gunnar, 3,929,958.

Riegler, Ernst; and Schmidt, Manfred, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Expansion bearing assembly for a converter carrying trunnion. 3,929,389, Cl. 308-6.00R.

Rieth, Lawrence E., to Stewart-Warner Corporation. Solenoid valve assembly. 3,929,315, Cl. 251-129.000.

Rijkeboer, Albert: *See—*
Peters, Franciscus J. W. M.; Middelhoek, Servaas; and Rijkeboer, Albert, 3,929,460.

Riken Light Metal Industries Company, Ltd.: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Risley, Robert F., to Jos. Schlitz Brewing Company. Modulated speed control for a conveying system. 3,929,218, Cl. 198-37.000.

Rivera, Richard L. Apparatus for testing ski boot fit. 3,929,329, Cl. 272-57.00D.

Robatel S.L.P.I.: *See—*
Bochard, Camille, 3,930,166.

Robbins, Howard M.: *See—*
Forgione, Peter Salvatore; and Robbins, Howard M., 3,929,580.

Robert Bosch G.m.b.H.: *See—*
Ackermann, Fritz; Honig, Gunter; and Schulz, Alfred, 3,930,201.
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.

Robert Bosch Verpackungsmaschinen G.m.b.H.: *See—*
Buchner, Norbert; Liede, Dieter; Schmeer, Peter; and Vogele, Gunther, 3,929,409.

Robert Manufacturing Company: *See—*
Phillips, Wendell, 3,929,149.

Roberts, Peter Christopher Tudor: *See—*
Baker, Ian Martin; Beynon, John David Emrys; and Roberts, Peter Christopher Tudor, 3,930,065.

Robertshaw Controls Company: *See—*
Caldwell, Edward N., 3,929,160.

Robertz, Hans: *See—*
Reuter, Guido; and Robertz, Hans, 3,929,184.

Robinson, Alfred; Schatz, Joseph S.; and Katz, Leonhard, to U. S. Radium Corporation. Cassette. 3,930,165, Cl. 250-480.000.

Rockwell International Corporation: *See—*
Tosti, Umberto V.; and Childs, Richard L., 3,929,171.

Rodgers, Robert E., to Stant Manufacturing Company, Inc. Remote pressure-vacuum relief valve assembly. 3,929,158, Cl. 137-493.900.

Rogalski, Werner: *See—*
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,929,880.

Rogers, Bruce C. Solar heat collector. 3,929,121, Cl. 126-271.000.

Rohm & Haas Company: *See—*
Kilbourn, Edward E.; and Weiler, Ernest D., 3,929,808.
Weiler, Ernest D., 3,929,810.

Rohr, Wolfgang: *See—*
Fischer, Adolf; Hamprecht, Gerhard; Mangold, Dietrich; and Rohr, Wolfgang, 3,929,454.

Rollet, Bernard: *See—*
Gruffaz, Max; and Rollet, Bernard, 3,929,687.

Rolls-Royce (1971) Limited: *See—*
Scott, William Murray, 3,929,106.

Romano, Elazar, legal representative: *See—*
Seragnoli, Ariosto, deceased; and Romano, Elazar, legal representative, 3,929,238.

Rombrecht, Hans-Malte: *See—*
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim, 3,929,714.

Rooney, Daniel G.: *See—*
Richards, Edward L., Paton, Charles R.; and Rooney, Daniel G., 3,930,214.

Rosa, Josef; and Petr, Vlastimil, to Vyskumny ustav stavebaich hmot. Apparatus for the manufacture of powdered lime. 3,929,417, Cl. 23-262.000.

Rosback, Donald H.; and Neuzil, Richard W., to Universal Oil Products Company. Method for manufacturing an adsorbent useful for olefin separation. 3,929,669, Cl. 252-455.00Z.

Roscoe, Edward J. Collapsible shelters. 3,929,147, Cl. 135-7.10A.

Rose, Edgar: *See—*
Turner, Robert K.; and Rose, Edgar, 3,929,111.

Rose, James S.: *See—*
Alberino, Louis M.; Farrissey, William J., Jr.; and Rose, James S., 3,930,097.

Rosen, Arye; and Reynolds, James Francis, to Troike, Robert L.; and RCA Corporation. Broad-band amplifier using cascaded class C amplifiers. 3,930,206, Cl. 330-53.000.

Rosen, George: *See—*
Reiter, Ralph H.; and Rosen, George, 3,929,490.

Rosenbaum, Georges: *See—*
Bouillon, Claude; DuFaure, Pierre; and Rosenbaum, Georges, 3,929,986.

Rosenbaum, Peter S. Instructional aid device. 3,928,922, Cl. 35-9.00R.

Rosendahl, Friedrich-Karl; Pelousek, Herbert; and Niederprum, Hans, to Bayer Aktiengesellschaft. Flame resistant composition of matter of high molecular weight linear polyesters. 3,929,720, Cl. 260-40.00P.

Rosenthal, Fritz, to SCM Corporation. Method for improving the photoconductive properties of dye sensitized zinc oxide. 3,929,479, Cl. 96-1.700.

Roslyakov, Vladimir Yakovlevich: *See—*
Raikov, Ivan Yakovlevich; Ivaschenko, Pavel Andreevich; Judin, Alexandr Nikolaevich; Pisarev, Georgy Lvovich; and Roslyakov, Vladimir Yakovlevich, 3,929,110.

Ross, Robert E., to Eastman Kodak Company. Color developer compositions containing improved yellow dye-forming coupler. 3,929,484, Cl. 96-55.000.

Rossini, George: *See—*
Gerlach, Robert L.; and Rossini, George, 3,930,163.

Rossmy, Gerd; and Koerner, Gotz, to Th. Goldschmidt AG. Fire extinguishing foam concentrate. 3,929,649, Cl. 252-3.000.

Rossomakho, Yakov Vulfovich: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Rossomakho, Yakov Vulfovich; and Butova, Margarita Nikolaevna, 3,930,139.

Rostron, Joseph R.; Brunson, Lawrence A.; and Soles, Otto H., to Westinghouse Electric Corporation. Pneumatic power-unit having a driving piston and an exhaust valve. 3,930,134, Cl. 200-82.00B.

Roto Rooter Corporation: *See—*
Peterson, Henry G.; and Grimes, Tom, 3,928,885.

Roussel-UCLAF: *See—*
Hirsch, Jean; and Buret, Jean Pierre, 3,929,994.

Rowbotham, Clifford: *See—*
Nuttall, Roy; and Rowbotham, Clifford, 3,929,526.

Roy, Della M., to Research Corporation. Porous biomaterials and method of making same. 3,929,971, Cl. 423-308.000.

Royal Industries, Inc.: *See—*
Shields, Ronald F., 3,930,084.

Rubin, Harry S. Mixing apparatus. 3,929,151, Cl. 137-268.000.

Ruemens, Wilhelm: *See—*
Petersen, Harro; Erhardt, Klaus; Ruemens, Wilhelm; Bille, Heinz; and Reuss, Guenter, 3,930,087.

Rufenacht, Kurt: *See—*
Kristinsson, Haukur; and Rufenacht, Kurt, 3,929,809.

Ruhe, Anthony: *See—*
Parkinson, John K.; and Ruhe, Anthony, 3,929,005.

Ruhrchemie Aktiengesellschaft: *See—*
Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, 3,929,900.

Runions, Sinville, to International Shoe Machine Corporation. Lasting machine having flexible lasting strap. 3,928,880, Cl. 12-8.200.

Rupp, Hans-Dieter: *See—*
Toth, Anton; Rupp, Hans-Dieter; and Meyer, Gerhard, 3,929,877.

Russell, Donald Henry; and Lenton, Robert Warren, to Atlantic Richfield Company. Stabilized ethylene-carbon monoxide copolymers. 3,929,727, Cl. 260-45.95F.

Rutherford, James Pennycook: *See—*
Brewster, Phillip William; Hamblin, Peter Collen; and Rutherford, James Pennycook, 3,929,654.

Rutten, Hermann: *See—*
Zumfeld, Heinz; Rutten, Hermann; and Bhattacharya, Nishit, 3,929,297.

Ryan, Francis William; Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, to Bell Telephone Laboratories, Incorporated. Technique for fabrication of foil electret. 3,930,066, Cl. 427-79.000.

Ryden, Vernon John; and Oakley, Robert Lawford, to St. Clare Engineering Limited. Drum lifters. 3,929,368, Cl. 294-103.000.

S. C. Johnson & Son, Inc.: *See—*
Chapman, Francis E.; and Grant, Robert F., 3,929,492.
Sramek, John A., 3,929,743.

S.I.T.A.V. S.p.A. - Societa Incremento Turistico Alberghiero Valdostano: *See—*
Mattioli, Luciano, 3,929,339.

S & W Fine Foods, Inc.: *See—*
Mattson, Peter H., 3,930,049.

Sabol, Alexander P., to United States of America, General Counsel-Code GP. Heat exchanger system and method. 3,929,305, Cl. 244-117.00A.

Saeki, Yukio: *See—*
Murata, Takao; Nakamura, Nobutaka; and Saeki, Yukio, 3,929,695.

Saida, Shigeki: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.

Saidla, Glen E. W., to Exxon Research & Engineering Co. Static mixers for viscous material. 3,929,318, Cl. 259-4.000.

St. Clare Engineering Limited: *See—*
Ryden, Vernon John; and Oakley, Robert Lawford, 3,929,368.

Sakai, Kaoru: *See—*
Takano, Nobuyoshi; Sakai, Kaoru; Aoki, Satoshi; and Yasuda, Kazuo, 3,929,411.

Sakamoto, Eiichi: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.

Sakata, Sumio: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.

Sakoh, Ichiro: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.

Saku, Isamu, to Kabushikikaisha Kawaidenkiseisakusho. Method for producing cartridge heaters. 3,928,909, Cl. 29-611.000.

Sakunaga, Kenichi: *See—*
Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.

Salava, Roger F.; Eastman, Brian G.; and King, George W., to Compugraphic Corporation. Character image generation apparatus and CRT phototypesetting systems. 3,930,251, Cl. 340-324.0AD.

Saleil, Jean: *See—*
Leroy, Pierre; Debras, Maurice; Cadart, Michel; and Saleil, Jean, 3,929,458.

Salmon, Michel: *See—*
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 3,930,105.

Salsgiver, James A.; and Malagari, Frank A., to Allegheny Ludlum Industries, Inc. Process involving cooling in a static atmosphere for high permeability silicon steel comprising copper. 3,929,522, Cl. 148-112.000.

Salter, Stephen Hugh. Apparatus and method for extracting wave energy. 3,928,967, Cl. 60-398.000.

Salters, Roelof Herman Willem; Boonstra, Lieuwe; and Lambrechtse, Cornelis Willem, to U.S. Philips Corporation. Integrated memory. 3,930,239, Cl. 340-173.00R.

Salukvadze, Larisa Viktorovna: *See—*
Salukvadze, Viktor Samsonovich; and Salukvadze, Larisa Viktorovna, 3,928,900.

Salukvadze, Viktor Samsonovich; and Salukvadze, Larisa Viktorovna. Rotating cutting tool. 3,928,900, Cl. 29-105.00R.

Salyer, Ival O.; and North, Charles J., to Monsanto Research Corporation. Large void-free polyethylene castings comprising high density polyethylene in a low density polyethylene matrix. 3,929,939, Cl. 260-897.00A.

Salzman, Nathan. Corrective shoe device. 3,929,139, Cl. 128-583.000.

Salzwedel, Arden L. Reversible hack saw blade. 3,929,050, Cl. 83-848.000.

Sampson, Ronald N.; and Chottiner, Jacob, to Westinghouse Electric Corporation. Hydrophobic mats for gas diffusion electrodes. 3,930,094, Cl. 428-240.000.

Samuel Jones & Company, Limited: *See—*
Budden, Brian Thomas, 3,929,068.

Samuelsson, Benny Roger: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Sander, Conrad. Method for curing a coating on a base. 3,930,064, Cl. 427-54.000.

Sanders Associates, Inc.: *See—*
Chicklis, Evan P.; and Kuppenheimer, John D., Jr., 3,930,158.

Sanders, James Milton: *See—*
Hall, John B.; and Sanders, James Milton, 3,929,677.

Sanders, Lloyd E. Conveyor belt stripper. 3,929,555, Cl. 156-584.000.

Sandler, Stanley Robert: *See—*
Kydonieus, Nicholas; and Sandler, Stanley Robert, 3,929,852.

Sandoz, Inc.: *See—*
Anderson, Paul L., 3,929,906.
Galantay, Eugene E., 3,929,902.
Simpson, William R. J., 3,929,884.

Sandoz Ltd., (Sandoz AG): *See—*
Krieger, Manfred; and Suess, Rudolf, 3,929,833.
Mayerhoefer, Horst; Mueller, Wolfgang; Sollberger, Urs; and Wolf, Rainer, 3,929,940.

Sandoz-Wander, Inc. (Sandoz, Inc.): *See—*
Timms, Alan R., 3,930,009.

San Miguel, Anthony, to United States of America, Navy. Means for the elimination of a cartridge rim. 3,929,074, Cl. 102-43.00P.

Sano: Konosuke; and Mitsugi, Koji, to Ajinomoto Co., Inc. Method of preparing L-tryptophan. 3,929,573, Cl. 195-29.000.

Sansum, Robert David, to Gerrard Industries Limited. Package strapping tool. 3,929,172, Cl. 140-93.200.

Sapetta, Lee Philip: *See—*
Knappe, LaVerne Frank; Sapetta, Lee Philip; Stroebel, Gary John; and Wilke, Myron Arden, 3,929,328.

Sapkus, Jurgis: *See—*
Lewis, J. Stephen; and Sapkus, Jurgis, 3,928,934.

Sapy, Jacques: *See—*
Balavoine, Loic; Cadot, Robert; and Sapy, Jacques, 3,929,278.

Sargent Industries, Inc.: *See—*
Smith, Fred T., 3,929,243.

Sasaki, Satoshi: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.

Sasaki, Takashi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Sasame, Takao; Shigeta, Toshihiko; and Yamada, Toshio, to Toyo Kogyo Co., Ltd. Electrodeposition of wear resistant and oil retentive nickel coatings and article having such a coating. 3,929,596, Cl. 204-49.000.

Sato, Hisatake, to Nippon Oil Company Ltd. Process for preparing resin for printing ink use. 3,929,736, Cl. 260-78.40D.

Sato, Ken: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Sato, Kozo. Method for cutting overlapping metal plates with gas heat. 3,929,515, Cl. 148-9.00R.

Sato, Takami: *See—*
Shibata, Osamu; Kojimoto, Susumu; Sato, Takami; and Tadokoro, Yoshio, 3,929,951.

Sato, Tomoari: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,929,612.

Savina, Valentina Alexandrovna: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Savoie, Robert Ellis: *See—*
Crane, Hewitt David; and Savoie, Robert Ellis, 3,930,229.

Sawyer, Edward C. Vertical lift cranes. 3,929,242, Cl. 214-390.000.
Saylor, Frederick A. Voltage regulator system. 3,930,197, Cl. 322-28.000.
Scapa Engineering Limited: *See—*
Banks, David Dugmore; and McManus, Francis, 3,929,061.
Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,929,818.
Schabert, Hans-Peter; and Winkler, Franz, to Siemens Aktiengesellschaft. Nuclear reactor equipped with a flooding tank and a residual heat removal and emergency cooling system. 3,929,567, Cl. 176-38.000.
Schabert, Hans-Peter; Danisch, Rudiger; and Strickroth, Erich, to Siemens Aktiengesellschaft. Nuclear power plant containment construction. 3,929,568, Cl. 176-38.000.
Schaedler, Alvin C. Self-storing dolly. 3,929,237, Cl. 214-86.00A.
Schafer, David E.: *See—*
Hamm, Philip C.; and Schafer, David E., 3,929,450.
Schaffer, Stephen P., to J. M. Ney Company, The. Palladium alloy for ceramic bonding. 3,928,913, Cl. 32-8.000.
Scharfenberger, James A., to Ransburg Corporation. Electrostatic method for forming structures and articles. 3,930,061, Cl. 427-27.000.
Schatz, Joseph S.: *See—*
Robinson, Alfred; Schatz, Joseph S.; and Katz, Leonhard, 3,930,165.
Schayes, Raymond Georges: *See—*
Schmidt, Rolf; Carl, Klaus; Gustin, Pol Ambroise Ghislain Joseph; and Schayes, Raymond Georges, 3,930,119.
Schelberg, Charles C., Jr.: *See—*
Morley, Richard E.; and Schelberg, Charles C., Jr., 3,930,233.
Schellinger, Alfred K.: *See—*
Miyoshi, T. Kenneth; Berthold, Cornelius E.; Stephens, Frank M., Jr.; and Schellinger, Alfred K., 3,929,461.
Schendeler, Franciscus J.: *See—*
Thurston, Franklin J.; Schendeler, Franciscus J.; and Jounen, Joseph C., 3,929,217.
Scherzer, Julius: *See—*
Parthasarathy, R.; and Scherzer, Julius, 3,929,620.
Schiller, Raymond E.: *See—*
Van Dyck, Emil J.; Malina, Jerry L.; and Schiller, Raymond E., 3,929,545.
Schilling, William F.; and Beltran, Adrian M., to General Electric Company. Forming a cladding sheet to a convex/concave substrate. 3,928,901, Cl. 29-156.80B.
Schlegel Manufacturing Company, The: *See—*
Smoot, Edward H., 3,928,898.
Schloss, Benjamin. Analytical process. 3,929,410, Cl. 23-230.00R.
Schlossbauer, Hubert: *See—*
Queisser, Rudolf; and Schlossbauer, Hubert, 3,930,234.
Schlotman, Walter F.: *See—*
Givler, John D.; Schlotman, Walter F.; and Sipos, David L., 3,929,287.
Schluckbier, Gary W., to Dec International Inc. Detacher mechanism for milking unit. 3,929,103, Cl. 119-14.080.
Schmeer, Peter: *See—*
Buchner, Norbert; Liede, Dieter; Schmeer, Peter; and Vogele, Gunther, 3,929,409.
Schmid, Wolfgang; Gutzwiller, Ernst; and Meyer, Urs, to Ciba-Geigy Corporation. Isothiocyanopyridine derivatives. 3,929,806, Cl. 260-294.80E.
Schmid, Wolfgang: *See—*
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, 3,929,343.
Schmidt, Adolf; Bartl, Herbert; and Meckbach, Heinrich, to Bayer Aktiengesellschaft. Continuous process for the production of copolymer dispersions. 3,929,706, Cl. 260-29.6TA.
Schmidt, Felix Helmut: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, 3,929,763.
Schmidt, Karl; Hansch, Ferdinand; Rombrecht, Hans-Malte; and Beck, Hans-Joachim. Polyester resins. 3,929,714, Cl. 260-33.40P.
Schmidt, Karl: *See—*
Chattopadhayay, Asoke; and Schmidt, Karl, 3,929,114.
Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 3,929,389.
Schmidt, Rolf; Carl, Klaus; Gustin, Pol Ambroise Ghislain Joseph; and Schayes, Raymond Georges, to U.S. Philips Corporation. Facsimile apparatus for writing and reading mechanically moving documents. 3,930,119, Cl. 178-7.600.
Schmoller, Robert L. Bag fastener. 3,928,893, Cl. 24-30.500.
Schmunk, John D.; Child, James L., Jr.; Shroy, Robert E.; and Wise, John, to Hancock Brick and Tile Company. Connecting joint structure for corrugated plastic tubing. 3,929,359, Cl. 285-401.000.
Schneider, William P.: *See—*
Pike, John E.; and Schneider, William P., 3,929,861.
Schnell, Hermann: *See—*
Darsow, Gerhard; Bottenbruch, Ludwig; and Schnell, Hermann, 3,929,901.
Schnur, Friedrich; Hibbel, Josef; and Cornils, Boy, to Ruhrchemie Aktiengesellschaft. Continuous process for the production of oxygen containing compounds. 3,929,900, Cl. 260-604.0HF.
Schollenberger, Charles S.; Dinbergs, Kornelius; and Kelley, Philip C., to B. F. Goodrich Company, The. Color stabilized polyurethanes. 3,929,726, Cl. 260-45.85B.
Schon, Otmar, to Greer Hydraulics, Inc. Pressure vessel with sensing device. 3,929,163, Cl. 138-30.000.
Schonhorn, Harold: *See—*
Ryan, Francis William; Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,930,066.
Schreiner, Felix: *See—*
Abraham, Bernard M.; and Schreiner, Felix, 3,929,980.
Schroeder, Allen J. Collapsible shelter. 3,929,145, Cl. 135-1.00R.
Schubert, Emil Georg. Protective device for vehicles. 3,929,349, Cl. 280-150.00B.
Schubert, Emil Georg. Multiple rotary engine. 3,929,402, Cl. 123-8.470.
Schuller, Walter H., to United States of America, Agriculture. Removal of mercury from aqueous solutions employing naval stores products. 3,929,634, Cl. 210-49.000.
Schuller, Walter H.: *See—*
Severson, Ray F.; Schuller, Walter H.; Joye, N. Mason, Jr.; and Lawrence, Ray V., 3,929,755.
Schultz, Everett M.: *See—*
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Woltersdorf, Otto W., Jr., 3,929,872.
Schulz, Alfred: *See—*
Ackermann, Fritz; Honig, Gunter; and Schulz, Alfred, 3,930,201.
Schwartz, Bertram: *See—*
Ermanis, Felix; and Schwartz, Bertram, 3,929,589.
Schwartz, Maxime: *See—*
Ullmann, Agnes; and Schwartz, Maxime, 3,930,028.
Schwartz, Murray Arthur; and Llewellyn, Thomas Oscar, to United States of America, Interior. Process for manufacturing wallboard and the like. 3,929,947, Cl. 264-42.000.
SCM Corporation: *See—*
Rosenthal, Fritz, 3,929,479.
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., to Shakespeare Company. Hank forming machine for a pole construction and method of forming a pole. 3,929,543, Cl. 156-169.000.
Scott, Francis A.: *See—*
Campbell, Scott V., 3,930,246.
Scott, Hubert D., to Texaco Inc. Measurement of subsurface formation lithology, including composition and fluids, using capture gamma spectroscopy. 3,930,153, Cl. 250-270.000.
Scott, Hubert D., to Texaco Inc. Measurement of subsurface formation lithology, including composition and fluids, using gamma spectroscopy and thermal neutron decay. 3,930,154, Cl. 250-270.000.
Scott, William Murray, to Rolls-Royce (1971) Limited. Combustion chamber arrangement for rotary compression-ignition I.C. engines. 3,929,106, Cl. 123-8.110.
Screentex Limited: *See—*
Burdis, Roy Stonier, 3,929,227.
Scuffell, Derek Edgar Alexander: *See—*
Findlay, Donald Urquhart; McGaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,959.
Findlay, Donald Urquhart; McCaffrey, Francis Hamnet Garland; and Scuffell, Derek Edgar Alexander, 3,929,960.
Sea Tank Co.: *See—*
Lacroix, Roger, 3,928,982.
Sears, Richard J. Drop finger conveyor, hanger and method. 3,929,078, Cl. 104-111.000.
Segmiller, James L.: *See—*
Metz, Ferdinand E.; Boyce, Finis O.; and Segmiller, James L., 3,930,030.
Sehgal, Surendra N.; Blazekovic, Teodora M.; and Vezina, Claude, to Ayerst McKenna and Harrison Ltd. Rapamycin and process of preparation. 3,929,992, Cl. 424-122.000.
Seidel, Peter-Rudolf: *See—*
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,930,003.
Seims, Warren J.; and Farkas, Gabor, to Acme Air Appliance Co., Inc. Tool for tubeless tire valves. 3,928,902, Cl. 29-221.500.
Seki, Michiharu: *See—*
Kudo, Tetsuichi; Gejyo, Tetsuo; Yoshida, Kazuetsu; and Seki, Michiharu, 3,929,670.
Sekihara, Takeshi: *See—*
Itoh, Iko; Sekihara, Takeshi; and Emura, Tomoyuki, 3,929,753.
Sekiya, Tetsuo; and Hienuki, Atsushi, to Sony Corporation. Protective device for brushless DC motor. 3,930,186, Cl. 317-13.00B.
Sellstedt, John H.: *See—*
Teller, Daniel M.; and Sellstedt, John H., 3,929,781.
Seni, Leonard S.; Davis, James E.; and Harrison, Henry R., to Texaco Inc. Dual purpose cutting oil. 3,929,652, Cl. 252-46.700.
Senor, Ronald E., to Texas Instruments Incorporated. Nonresettable thermally actuated switch. 3,930,215, Cl. 337-407.000.
Seragnoli, Ariosto, deceased; and Romano, Elazar, legal representative, to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Equipment for supplying containers filled with cigarettes to the supply hopper charging mechanism of cigarette packeting machines. 3,929,238, Cl. 214-89.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for accumulating and supplying lengths of material in sheet form. 3,929,326, Cl. 271-3.100.
Serban, Alexander; and Engel, Phillip Knox, to ICI Australia Limited. 2,3-Dihydro-2,2-dimethyl-7-isopropyl benzofuran and 2-(2,3-dihydro-2,2-dimethyl-7-benzofuranyl)isopropyl hydroperoxide. 3,929,837, Cl. 260-346.20R.
Sermons, Gunar Yanovich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorofeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich;

Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.
Serur, Juan R. Fluid flow regulator. 3,929,157, Cl. 137-453.000.
Sessler, Gerhard Martin: *See*—
Ryan, Francis William; Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,930,066.
Seubert, Jurgen: *See*—
Kirchlechner, Richard; Rogalski, Werner; and Seubert, Jurgen, 3,929,880.
Severson, Ray F.; Schuller, Walter H.; Joye, N. Mason, Jr.; and Lawrence, Ray V., to United States of America, Agriculture. Pyrolyzed rosin products as synthetic rubber tackifiers. 3,929,755, Cl. 260-106.000.
Seyler, Jay Kenneth: *See*—
Hughes, John Lawrence; Seyler, Jay Kenneth; and Liu, Robert Chung-Huang, 3,929,758.
Shah, Tilak M., to Upjohn Company, The. Low temperature resistant polyurethane elastomers. 3,929,732, Cl. 260-77.5AN.
Shakespeare Company: *See*—
Scott, Arthur Leslie; Parsons, J. Hilton, Jr.; and Hammond, John S., 3,929,543.
Shamlian, Ralph B., to Farallon Industries, Inc. Method for customizing mouthpiece retainer for underwater breathing apparatus. 3,929,548, Cl. 156-245.000.
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., to General Foods Corporation. Simulated strawberry slices and method of preparing the same. 3,930,034, Cl. 426-104.000.
Shapiro, Alec, to Adhesive Materials Limited. Printing characters for use in transfer printing processes. 3,930,092, Cl. 428-204.000.
Shapiro, Stanley: *See*—
Cheskis, Harvey P.; Shapiro, Stanley; and Pryor, Michael J., 3,929,516.
Sharki, Martin James, to Dresser Industries, Inc. Periodically actuated pneumatic ratemeter. 3,929,014, Cl. 73-168.000.
Sharpe, Anthony N.; and Michaud, Gregory L., to Canadian Patents and Development Limited. Apparatus for enumerating microorganisms. 3,929,583, Cl. 195-127.000.
Sharps Associates: *See*—
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, 3,929,835.
Sharychenkov, Alexandr Alexeevich. Twisting mechanism drive for spinning and twisting frames. 3,929,027, Cl. 74-242.15R.
Shaw, Alan C., to Ontario Paper Company Limited, The. Method of adding a soluble aluminum salt to chemically softened wood chips followed by mechanical refining. 3,929,558, Cl. 162-28.000.
Shawhan, Elbert N., to Sun Oil Company of Pennsylvania. Borehole signalling by acoustic energy. 3,930,220, Cl. 340-18.0FM.
Shea, Philip J.: *See*—
Abdallah, Abdulmuniem H.; and Shea, Philip J., 3,930,019.
Shealy, Noah A., to Clark Equipment Company. Limited slip differential with negligible bias under light load conditions. 3,929,036, Cl. 74-711.000.
Sheeler, Albert P., to Reimuller, Christian J. Electrical grounding device. 3,930,111, Cl. 174-6.000.
Sheesley, John M.; and Gulick, Ronald A., to Research Engineering Co. Actuator. 3,929,024, Cl. 74-104.000.
Shek, Efraim: *See*—
Higuchi, Takeru; Bodor, Nicolae S.; and Shek, Efraim, 3,929,813.
Shell Oil Company: *See*—
van der Gaag, Gerrit; and Tomey, Thomas C., 3,929,953.
Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Synergistic compositions containing bis (trichloromethyl) sulfone and their use. 3,929,561, Cl. 162-161.000.
Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Synergistic compositions containing 2,2-dibromo-3-nitrilopropionamide and their use. 3,929,562, Cl. 162-161.000.
Shema, Bernard F.; and Brink, Robert H., Jr., to Betz Laboratories, Inc. Synergistic compositions containing N (2 nitrobutyl) morpholine and their use. 3,929,563, Cl. 162-161.000.
Shenk, Edwin K.: *See*—
Biber, Conrad H.; and Shenk, Edwin K., 3,930,184.
Sheppard, William L., to AVM Corporation. Vacuum reservoir. 3,929,249, Cl. 220-71.000.
Shestakovsky, Mikhail Fedorovich: *See*—
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.
Shevchenko, Alexandr Alexandrovich: *See*—
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorcfeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.
Shiah, Chyn Duog. Titanium purification process. 3,929,962, Cl. 423-82.000.
Shibata, Hiroshi; Kokubu, Yoshikazu; and Okazaki, Isao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Multiple vertical diaphragm electrolytic cell having gas-bubble guiding partition plates. 3,930,151, Cl. 204-258.000.
Shibata, Kazuhiro: *See*—
Akasaki, Masato; Takashima, Hiroshi; and Shibata, Kazuhiro, 3,930,018.
Shibata, Kazuo: *See*—
Tanimoto, Tadashi; and Shibata, Kazuo, 3,930,080.
Shibata, Osamu; Kojimoto, Susumu; Sato, Takami; and Tadokoro, Yoshio, to Sumitomo Chemical Company, Limited. Method of extruding hollow structure having plural parallel cells. 3,929,951, Cl. 264-89.000.
Shieh, Ming K., to Dresser Industries, Inc. Stator and armature for a vibrating motor. 3,930,174, Cl. 310-29.000.
Shields, Ronald F., to Royal Industries, Inc. Plastic decorative inlay in a floor mat. 3,930,084, Cl. 428-67.000.
Shigeta, Masayuki: *See*—
Ichiryu, Ken; Shigeta, Masayuki; Nakamura, Ichiro; and Kajiwara, Toshiyuki, 3,928,994.
Shigeta, Toshihiko: *See*—
Sasame, Takao; Shigeta, Toshihiko; and Yamada, Toshio, 3,929,596.
Shillinglaw, John P., Jr.: *See*—
Mead, Theodore C.; Ashton, William B.; and Shillinglaw, John P., Jr., 3,929,616.
Shimada, Haruo: *See*—
Okada, Hideya; and Shimada, Haruo, 3,929,472.
Shimazu, Ken-Ichi: *See*—
Chu, Simon Long; and Shimazu, Ken-Ichi, 3,929,591.
Shimizu, Mahito: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, 3,929,604.
Shimoshinbara, Yoshihiro: *See*—
Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, 3,929,728.
Shindo, Mizuo: *See*—
Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, 3,929,728.
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, to Oxy Metal Industries Corporation. Composition and process for displacement plating of zinc surfaces. 3,930,081, Cl. 427-421.000.
Shinpo, Shozo: *See*—
Aiba, Yoshikazu; Furumori, Takaki; Shinpo, Shozo; and Funabiki, Kaoru, 3,929,666.
Shionogi & Co., Ltd.: *See*—
Nagata, Wataru, 3,929,834.
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, to Fuji Photo Film Co., Ltd. Method for producing magnetic recording medium. 3,929,604, Cl. 204-192.000.
Shoemaker, Philip D.; and McQueary, Hobert O., to Ellingson Timber Co. Manufacture of multilayer panels using polyisocyanate: formaldehyde binder system. 3,930,110, Cl. 428-424.000.
Shooter, Douglas: *See*—
Kreidl, Ekkehard L.; and Shooter, Douglas, 3,929,422.
Shore, Jack H.: *See*—
Barnes, Clarence W.; and Shore, Jack H., 3,929,125.
Short, James N., to Phillips Petroleum Company. Coating with arylene sulfide polymer containing compounds to enhance cure. 3,930,078, Cl. 427-388.000.
Short, Oliver Alton, to Du Pont de Nemours, E. I., and Company. Bismuth-containing silver conductor compositions. 3,930,093, Cl. 428-208.000.
Shriver, Edward L.: *See*—
United States of America, National Aeronautics and Space Administration: Shriver, Edward L.; and Igenbergs, Eduard B., 3,929,119.
Shroy, Robert E.: *See*—
Schmunk, John D.; Child, James L., Jr.; Shroy, Robert E.; and Wise, John, 3,929,359.
Shumaker, John Frederick, to J. I. Case Company. Backhoe actuator. 3,929,239, Cl. 214-138.00R.
Shuster, Edward J.: *See*—
Chappell, Robert L.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred H., 3,929,676.
Sicking, Heinrich, to Olympia Werke AG. Apparatus for applying a liquid in droplets to a surface. 3,930,260, Cl. 346-140.000.
Sicree, Albert J.; and Arnold, Fred E., to United States of America, Air Force. 2,3,7,8-Tetraaminodibenzothiophene 5,5-dioxide and process therefor. 3,929,832, Cl. 260-329.300.
Siegle, Peter; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. N-methyl-n-(3-trifluoromethylphenylmercapto)-carbamic acid dihydrobenzofuranyl esters. 3,929,838, Cl. 260-346.20R.
Siemens Aktiengesellschaft: *See*—
Haass, Adolf, 3,930,203.
Liska, Manfred, 3,930,190.
Loderer, Peter, 3,930,191.
Lutz, Karl-Anton, 3,930,124.
Olsen, Willi; and Lieske, Manfred, 3,930,188.
Queisser, Rudolf; and Schlossbauer, Hubert, 3,930,234.
Reiss, Karl-Hans, 3,930,162.
Schabert, Hans-Peter; and Winkler, Franz, 3,929,567.
Schabert, Hans-Peter; Danisch, Rudiger; and Strickroth, Erich, 3,929,568.
Siemens, Richard E.; and Good, Philip C., to United States of America, Interior. Process for recovery of non-ferrous metals from oxide ores and concentrates. 3,929,468, Cl. 75-103.000.
Sifniades, Stylianos: *See*—
Fuhrmann, Robert; Sifniades, Stylianos; and Tunick, Allen Abraham, 3,929,885.
Simon, Erich: *See*—
Bretthauer, Klaus; and Simon, Erich, 3,929,073.

Simon, Wolfgang: *See—*
Brinkmann, Dieter; Simon, Wolfgang; and Zimon, Heinrich, 3,929,188.

Simplex Specialty Co., Inc.: *See—*
van Kempen, Charles, 3,929,553.

Simpson, Paul A., to Cambridge Thermionic Corporation. Damper system for suspension systems. 3,929,390, Cl. 308-10.000.

Simpson, Tommy G.: *See—*
Appleby, Albert E.; and Simpson, Tommy G., 3,929,637.

Simpson, William R. J., to Sandoz, Inc. Intermediates in the synthesis of 5-alkylamino-7-phenyl or substituted phenyl-2,3-dihydro-1H-1,4-diazepines. 3,929,884, Cl. 260-564.00R.

Sims, Royal W. Concrete mixer bowl and method for constructing same. 3,929,321, Cl. 259-175.000.

Sinfelt, John H., Barnett, Allan E.; and Carter, James L., to Exxon Research & Engineering Co. Hydrocracking process with tri-metallic catalyst. 3,929,619, Cl. 208-111.000.

Singer, Alec. Machine for wrapping articles. 3,928,941, Cl. 53-182.000.

Singer Company, The: *See—*
Ketterer, Stanley Joseph, 3,929,081.
Zocher, Josef, 3,929,082.

Singerman, Gary M., to Gulf Research & Development Company. Hydroxy-, alkoxy-, and alkylcarbamoyloxy-2,1-benzisothiazoles. 3,929,815, Cl. 260-304.00A.

Singh, Gyanendra: *See—*
Japikse, Cornelis Hendrikus; Singh, Gyanendra; and Kennedy, Timothy J., 3,930,053.

Singh, Harbans. Spectral balancing means for color photography. 3,929,487, Cl. 96-84.00R.

Sipos, David L.: *See—*
Givler, John D.; Schlotman, Walter F.; and Sipos, David L., 3,929,287.

Sirieix, Michel Benoit: *See—*
Ameurlaine, Jacques Francois; and Sirieix, Michel Benoit, 3,930,161.

Sirotenko, Viktor Georgievich: *See—*
Ioffe, Benyamin Alexandrovich; Kalnin, Robert Karlovich; Dorofeev, Vyacheslav Semenovich; Sirotenko, Viktor Georgievich; Larin, Vladimir Borisovich; Sermons, Gunar Yanovich; and Shevchenko, Alexandr Alexandrovich, 3,930,212.

Sjostrand, Sven Erik: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Skender, Davorin: *See—*
Cohen, Hyman; Vago, Paul; and Skender, Davorin, 3,930,129.

Skoda, William G.: *See—*
Ocken, Alfred G., Jr.; and Skoda, William G., 3,929,022.

Skreckoski, Gerald R.: *See—*
Moynahan, Edward B.; Brunner, August H., Jr.; and Skreckoski, Gerald R., 3,929,466.

Skreosen, Ivar: *See—*
Heimdal, Ivar Dagfinn; and Skreosen, Ivar, 3,929,263.

Slane, Billy J.: *See—*
Denevi, Pietro G.; DiDuca, Mark B.; Slane, Billy J.; and Vence, Thomas D., 3,929,628.

Slemmons, John W. Stand-off type wall-mounted picture frame. 3,928,931, Cl. 40-152.100.

Slikkers, George, Jr., to Organic Chemicals Company, Inc. Process for treatment of organic solvent-containing waste sludges. 3,929,586, Cl. 203-37.000.

Sljusar, Anatoly Emelyanovich. Pivotal pipe joint. 3,929,355, Cl. 285-39.000.

Sloan, Samuel. Method for sealing leaks in rigid hollow articles. 3,930,068, Cl. 427-140.000.

Smalligan, Wayne J.: *See—*
Kelly, Vincent J.; Cloud, Larry L.; and Smalligan, Wayne J., 3,930,027.

Smith, Baynard R.; and Treptow, Arnold W., to Electro Oxide Corporation. Bonded silver article, composition, and method of bonding silver to a ceramic substrate. 3,929,491, Cl. 106-1.000.

Smith, Charles A., Jr. Clothes-carrying assembly. 3,929,224, Cl. 206-287.000.

Smith, David J., to Egan Machinery Company. Extruder feed section. 3,929,323, Cl. 259-192.000.

Smith, Fred T., to Sargent Industries, Inc. Refuse collection apparatus. 3,929,243, Cl. 214-518.000.

Smith, Joling P., to Keystone International, Inc. Valve actuator. 3,929,058, Cl. 92-13.000.

Smith, Millard F.: *See—*
Braytenbah, Andrew S.; Jaegtnes, Karl O.; and Smith, Millard F., 3,928,976.

Smith, Pat E., to Gary Aircraft Corporation. Process for biochemical reactions. 3,929,630, Cl. 210-17.000.

Smith, Peter John, to Howson-Algraphy Limited. Light sensitive diazo composition with azo dye formed from a diazonium salt and a novolak resin. 3,929,488, Cl. 96-91.00R.

Smith, Robert L. Surfboard construction. 3,929,549, Cl. 156-245.000.

Smith, Russell M., to General Electric Company. Wheel slip correction system. 3,930,189, Cl. 318-52.000.

Smith, William Paul; and Matsuyama, Glen, to Graphic Arts Packaging Corporation. Pillow box blank. 3,929,222, Cl. 206-45.140.

Smoot, Edward H., to Schlegel Manufacturing Company, The. Upholstery attacher. 3,928,898, Cl. 24-259.0FS.

Snam Progetti S.p.A.: *See—*
Buonomo, Franco; Fattore, Vittorio; Zanoni, Gianfranco; and Notari, Bruno, 3,929,681.

Snamprogetti S.p.A.: *See—*
Dell'Amico, Daniela Belli; and Calderazzo, Fausto, 3,929,973.

Snapp, Thomas C., Jr.; and Blood, Alden E., to Eastman Kodak Company. Ether triester derivatives of p-dioxanone. 3,929,846, Cl. 260-410.600.

Snapp, Thomas C., Jr.; and Blood, Alden E., to Eastman Kodak Company. Ether diester derivatives of p-dioxanone. 3,929,847, Cl. 260-410.600.

Snarey, Michael: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,930,004.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Nistri, Ugo; Parodi, Antonio; and Vargiu, Silvio, 3,929,696.

Societe Anonyme de Telecommunications: *See—*
Ameurlaine, Jacques Francois; and Sirieix, Michel Benoit, 3,930,161.

S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard; and Mahr, Rene N., 3,929,240.

Societe Anonyme dite: Boracier: *See—*
Fagniart, Gaston, 3,928,940.

Societe Anonyme dite: L'Oreal: *See—*
Bouillon, Claude; DuFaure, Pierre; and Rosenbaum, Georges, 3,929,986.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,403.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,929,404.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Mosher, Arthur Joseph; and Yingst, Donald Eugene, 3,930,045.
van de Rovaart, Paul; and Wuhrmann, Jean-Jacques, 3,930,044.

Societe Generale de Fonderie: *See—*
Delpla, Claude, 3,929,283.

Societe Nationale des Petroles d'Aquitaine: *See—*
Lutz, Jean; Traille, Andre; and Besnard, Francois, 3,929,009.

Societe Nationale des Poudres et Explosifs: *See—*
Pech, Bernard M., 3,929,350.

Societe Nouvelle de Roulements: *See—*
Beauchet, Jean, 3,929,044.

Societe Rhodiaceta: *See—*
Allard, Pierre, 3,929,691.

Soles, Otto H.: *See—*
Rostron, Joseph R.; Brunson, Lawrence A.; and Soles, Otto H., 3,930,134.

Solimar, Keith F., to Butler Manufacturing Company. Aeration device and method for assisting discharge of material from containers. 3,929,261, Cl. 222-195.000.

Sollberger, Urs: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Sollberger, Urs; and Wolf, Rainer, 3,929,940.

Solo, Alan J., to Knock-N-Lok. Supporting fastener. 3,929,311, Cl. 248-217.000.

Solomon, Arieh, to Avraham Deshe. Dispenser for ice cubes and the like. 3,929,256, Cl. 221-81.000.

Solomon, David Henry: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,929,502.

Solomon, Ralph E., to Jade Controls, Inc. Thermocouple assembly. 3,929,511, Cl. 136-228.000.

Solvay & Cie: *See—*
Degueldre, Louis; Gobillon, Yves; Clerbois, Lucien; and Bourgeois, Louis, 3,929,608.

Sone, Isamu: *See—*
Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, 3,929,963.

Sony Corporation: *See—*
Sekiya, Tetsuo; and Hienuki, Atsushi, 3,930,186.

Soprosoie: *See—*
Ravet, Georges; and Chaux, Jean-Bernard, 3,929,408.

Sorenson, John F.: *See—*
Locke, Frank W.; and Sorenson, John F., 3,929,225.

Soudijn, Willem: *See—*
Janssen, Paul Adriaan Jan; van Wijngaarden, Ineke; and Soudijn, Willem, 3,929,801.

Sourirajan, Srinivasa: *See—*
Thayer, William; Pageau, Lucien; and Sourirajan, Srinivasa, 3,929,945.

Southern Railway Company: *See—*
Larsen, Glen D., 3,929,384.

Southwire Company: *See—*
Cook, Henry S., 3,929,231.

Sowell, Charles L.: *See—*
Meshri, Dayal T.; White, Wayne E.; and Sowell, Charles L., 3,929,918.

Spanjersberg, Arie Adriaan, to De Staat der Nederlanden, te dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method and device for reading characters, preferably digits. 3,930,228, Cl. 340-146.3SG.

Spath, Tommy W. Internal combustion engine. 3,928,971, Cl. 60-614.000.

Spatz, Sidney M., to Mead Corporation, The. Pyrazoloxanthere compounds and process for producing same. 3,929,825, Cl. 260-310.00C.

Spears, Johnnie E.; and Caldwell, Donald L., to Phillips Petroleum Company. Method for heating thermoplastic elements. 3,929,541, Cl. 156-157.000.

Spector, George: *See—*
Denunzio, Anthony, 3,928,948.

Speich, Peter: *See—*
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, 3,929,955.

Sperry Rand Corporation: *See—*
Becker, Kenneth F.; and Pedersen, Nicholas F., 3,928,968.
McAvoy, Dennis J., 3,929,159.

Spieth, Manfred: *See—*
Stiltz, Erwin; Langhoff, Boris; and Spieth, Manfred, 3,929,195.

Sponer, Gisbert: *See—*
Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, 3,929,793.

Sprang, Richard W.: *See—*
Flinner, Vaughn D.; and Sprang, Richard W., 3,929,150.

Square D Company: *See—*
Khalid, Joseph M., 3,929,660.

Squire, Edward Noonan, to Du Pont de Nemours, E. I., and Company. Synthesis of aromatic amines by reaction of aromatic compounds with ammonia. 3,929,889, Cl. 260-571.000.

Sramek, John A., to S. C. Johnson & Son, Inc. Polyampholytes. 3,929,743, Cl. 260-80.800.

Stach, Kurt: *See—*
Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, 3,929,764.

Staffier, Thomas L.: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., 3,930,090.

Stagi, Mauro, to Ciba-Geigy AG. Indazole derivatives as optical brighteners. 3,929,826, Cl. 260-310.00D.

Stalvey, Louis L.: *See—*
Hall, Claude E.; and Stalvey, Louis L., 3,929,701.

Stamicarbon N.V.: *See—*
van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., 3,929,909.
van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., 3,929,911.

Stanadyne, Inc.: *See—*
Givler, John D.; Schlotman, Walter F.; and Sipos, David L., 3,929,287.

Standard Oil Company, The: *See—*
Callahan, James L., 3,929,859.
Cerefice, Steven A.; and Fields, Ellis K., 3,929,711.
Grasselli, Robert K.; and Friedrich, Maria S., 3,929,899.

Stanford Research Institute: *See—*
Crane, Hewitt David; and Savoie, Robert Ellis, 3,930,229.

Stant Manufacturing Company, Inc.: *See—*
Rodgers, Robert E., 3,929,158.

Starr, Louis J. Bed with circulated air. 3,928,876, Cl. 5-284.000.

Stauffer Chemical Company: *See—*
Feminella, Joseph V.; Melachouris, Nicholas; and Lauck, Robert M., 3,930,056.
Gallagher, Ruth E., 3,929,933.
Honig, Milton L., 3,929,688.

Stauffer, Norman L., to Honeywell Inc. Automatic focus apparatus. 3,930,261, Cl. 354-25.000.

Steck, Howard A.; and DiVito, Ronald J. Self actuating wallet alarm. 3,930,249, Cl. 340-280.000.

Steigerwald, Robert L.: *See—*
Park, John N.; Steigerwald, Robert L.; and Walker, Loren H., 3,930,196.

Stemme, Reiner: *See—*
Leuenberger, Hans-Ulrich; and Stemme, Reiner, 3,929,443.

Stenkvist, Sven Einar, to Allmanna Svenska Elektriska Aktiebolaget. Direct current electric arc furnace and method for melting metal scrap. 3,929,457, Cl. 75-10.00R.

Stenz, Rudolf, to Dipl.-ing. Rudolf Konwitschny. Ski lock. 3,928,990, Cl. 70-58.000.

Stephens, Charles Edward. Refinish painting method. 3,930,069, Cl. 427-142.000.

Stephens, Frank M., Jr.: *See—*
Miyoshi, T. Kenneth; Berthold, Cornelius E.; Stephens, Frank M., Jr.; and Schellinger, Alfred K., 3,929,461.

Stephens, James B., to Westates Space-Era Products, Inc. Fluid dispensing structures. 3,929,258, Cl. 222-1.000.

Stephens, Richard G. Pattern analysis method and apparatus. 3,930,230, Cl. 340-146.3AG.

Stern, Hansjoerg, to General Electric Company. Fluidic gauging sensor head. 3,929,002, Cl. 73-37.700.

Stern, William R.; Jansen, Malcolm L.; and Vance, Bess L., to Anaconda Company, The. Recovery of copper and zinc from low-grade non-ferrous materials. 3,929,598, Cl. 204-108.000.

Sternbach, Leo Henryk: *See—*
Metlesics, Werner; and Sternbach, Leo Henryk, 3,929,766.

Sterndent Corporation: *See—*
French, Park, 3,930,149.

Stevenson, John L., to Cosden Oil & Chemical Company. Polyisobutylene nucleating agents for expandable styrene polymer compositions. 3,929,686, Cl. 260-2.50B.

Stevenson, Paul D.: *See—*
Green, Raymond J.; and Stevenson, Paul D., 3,929,117.

Steward, David L.; and Tong, Wen-Hong, to Dow Chemical Company, The. Polycationic interferon induces. 3,929,991, Cl. 424-78.000.

Stewart, John L.: *See—*
Mazzoni, Renato J.; Bowser, George H.; and Stewart, John L., 3,928,953.

Stewart-Warner Corporation: *See—*
Rieth, Lawrence E., 3,929,315.

Stichting Revalidatie Instituut Muiderpoort: *See—*
Zevering, Willem, 3,928,873.

Stiltz, Erwin; Langhoff, Boris; and Spieth, Manfred, to Licentia Patent-Verwaltungs-G.m.b.H. Hammer drill. 3,929,195, Cl. 173-109.000.

Stoeber, Hans, to Stoeber, Hans. Striking tool. 3,929,296, Cl. 241-197.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,929,798.

Stojek, Dieter, to Ford Motor Company. Thrust bearing retainer. 3,929,395, Cl. 308-167.000.

Stolins, Arthur B.: *See—*
Young, Robert R.; Randleman, Patrick L.; and Stolins, Arthur B., 3,929,413.

Storar, Robert C., to United Systems Corporation. Bipolar dual-slope analog-to-digital converter. 3,930,252, Cl. 340-347.0NT.

Stork, Harald: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, 3,929,763.
Fauland, Erich; Kampe, Wolfgang; Stach, Kurt; Stork, Harald; and Dietmann, Karl, 3,929,764.

Strandlund, Gert Christer: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 3,930,016.

Stratynski, Eugene Edward, to Eaton Corporation. Actuating means for a butterfly valve. 3,929,314, Cl. 251-58.000.

Streck, Roland; and Weber, Heinrich, to Chemische Werke Huls Aktiengesellschaft. Process for the production of polymeric hydrocarbons having reactive silyl end groups. 3,929,850, Cl. 260-448.20E.

Streicher, Michael A., to Du Pont de Nemours, E. I., and Company. Chromium, molybdenum ferritic stainless steels. 3,929,473, Cl. 75-128.00W.

Strickroth, Erich: *See—*
Schabert, Hans-Peter; Danisch, Rudiger; and Strickroth, Erich, 3,929,568.

Stroebel, Gary John: *See—*
Knappe, LaVerne Frank; Sapetta, Lee Philip; Stroebel, Gary John; and Wilke, Myron Arden, 3,929,328.

Strohmeyer, Max: *See—*
Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, 3,929,898.

Stromberg, Nils Erik; and Lindberg, Ulf Engelbert, to Sunds Aktiebolag. Binding machine. 3,929,063, Cl. 100-26.000.

Strong, Robert Edmund, to United Kingdom Atomic Energy Authority. Treatment of irradiated nuclear fuel elements. 3,929,961, Cl. 423-4.000.

Stuart, John J., Jr.: *See—*
McRae, William V., Jr.; and Stuart, John J., Jr., 3,929,076.

Stuart, Ronald Sangster: *See—*
Atherton, John Heathcote; Plumb, John Beckett; and Stuart, Ronald Sangster, 3,929,851.

Studiengesellschaft Kohle m.b.H.: *See—*
Wilke, Gunther; and Heimbach, Paul, 3,929,921.
Wilke, Gunther; and Heimbach, Paul, 3,929,922.

Su, Chiang-Shui. Leakage warning device for vehicle tire. 3,929,090, Cl. 116-34.00R.

Suchowski, Bernard; Lovitz, David D.; and Kissin, Claud W., to Hartz Mountain Corporation, The. Aquarium aerator and ornament holder. 3,929,102, Cl. 119-5.000.

Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, to Sumitomo Chemical Company, Limited. Process for separating resorcinol from hydroquinone. 3,929,910, Cl. 260-621.00B.

Suda, Tatsuo: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.

Suefuji, Mineo: *See—*
Kanda, Masao; and Suefuji, Mineo, 3,929,097.

Suess, Rudolf: *See—*
Krieger, Manfred; and Suess, Rudolf, 3,929,833.

Sugawara, Yoshiaki: *See—*
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.

Sugihara, Toshiyuki: *See—*
Abiko, Shiro; Yorihiro, Kazuo; Sugihara, Toshiyuki; and Hanawa, Masakazu, 3,929,618.

Sugimoto, Akiko: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.

Sugimoto, Yoshihiko: *See—*
Komatsu, Noboru; Arai, Tohru; Sugimoto, Yoshihiko; and Mizutani, Masayoshi, 3,930,060.

Sugitani, Tooru: *See—*
Kuwana, Noriaki; Suzuki, Kouichi; and Sugitani, Tooru, 3,929,572.

Sugiyama, Hironari: *See—*
Kimura, Ichiro; Sugiyama, Hironari; Takita, Kiyoshi; and Mizutani, Makoto, 3,929,452.

Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, to Riken Light Metal Industries Company, Ltd.; and Nippon Light Metal Co., Ltd. Method of forming colored oxide film on aluminum or aluminum alloy material. 3,929,593, Cl. 204-35.00N.

Sukeshita, Kazumi, to Nissan Motor Company Limited. Automotive steering system of rack and pinion type having means to prevent displacement of steering shaft in collision. 3,929,030, Cl. 74-492.000.

Sulzer Brothers Limited: *See—*
Pfarrwaller, Erwin, 3,929,169.

Sulzer, Harry E., to Quaker City Gear Works, Inc. Limit switch assembly. 3,930,133, Cl. 200-47.000.

Sumi, Kazuyoshi: *See—*
Asano, Toshiyasu; and Sumi, Kazuyoshi, 3,929,496.

Sumitomo Chemical Company, Limited: *See—*
Itoh, Iko; Sekihara, Takeshi; and Emura, Tomoyuki, 3,929,753.
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 3,929,747.
Shibata, Osamu; Kojimoto, Susumu; Sato, Takami; and Tadokoro, Yoshio, 3,929,951.
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.
Yamada, Eiji; and Nishikuri, Masao, 3,929,842.
Yamahara, Takeshi; Deguchi, Takashi; and Nakamura, Shinji, 3,929,773.
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,929,612.

Sumitomo Durez Company, Ltd.: *See—*
Murata, Takao; Nakamura, Nobutaka; and Saeki, Yukio, 3,929,695.

Sumitomo Electric Industries, Ltd.: *See—*
Miyauchi, Hirokazu; and Matsubara, Hironaga, 3,929,724.

Sumitomo Shipbuilding & Machinery Co., Ltd.: *See—*
Iizuka, Shimpei; and Ishimoto, Katsumi, 3,930,137.

Summers, Charles Gene, to Monsanto Company. N-1,3-Dimethylbutyl-N'-1,4-dimethylpentyl-p-phenylenediamine antiozonants. 3,929,855, Cl. 260-45.9QB.

Sun Chemical Corporation: *See—*
Reiter, Ralph H.; and Rosen, George, 3,929,490.

Sun Oil Company of Pennsylvania: *See—*
Shawhan, Elbert N., 3,930,220.

Sun Research and Development Co.: *See—*
Hosler, Peter; and Gates, David S., 3,929,923.

Sunaga, Hiromi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; Cimarusti, Christopher M.; and Sundeen, Joseph E., 3,930,022.

Sunds Aktiebolag: *See—*
Stromberg, Nils Erik; and Lindberg, Ulf Engelbert, 3,929,063.

Sundstrand Data Control, Inc.: *See—*
Muller, Hans Rudolf, 3,930,143.

Sunkist Growers, Inc.: *See—*
Paddock, Paul F.; and Cramer, Jerry W., 3,928,942.

Surgical Design Corporation: *See—*
Banko, Anton, 3,930,173.

Sutko, Adolph A.; and Myers, George M., to Continental Oil Company. Well pipe protector. 3,929,388, Cl. 308-4.00A.

Sutliff, Robert C. Film cartridge with retaining ring around a supply coil. 3,929,303, Cl. 242-194.000.

Sutter, Hanspeter, to Luwa AG. Apparatus for cleaning a rotating brush. 3,928,884, Cl. 15-21.00D.

Suzuki, Kouichi: *See—*
Kuwana, Noriaki; Suzuki, Kouichi; and Sugitani, Tooru, 3,929,572.

Suzuki, Masaaki: *See—*
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, 3,929,604.

Suzuki, Shigemutsu: *See—*
Kim, Kenneth; and Suzuki, Shigemutsu, 3,929,436.

Suzuki, Shigeto, to Chevron Research Company. Single stage conversion of secondary halocarbons to ketones. 3,929,896, Cl. 260-593.00R.

Suzuki, Tsutomu: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.

Suzuki, Yasuhide: *See—*
Kawase, Koichi; and Suzuki, Yasuhide, 3,929,113.

Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, to Teikoku Hormone Mfg. Co. Ltd. Novel 3-substituted-aminoazetidine derivatives and process for preparation thereof. 3,929,765, Cl. 260-239.00A.

Svensson, Karl Jonas Valter, to Granges Aktiebolag. Method of carrying out endothermic metallurgical reduction processes with the aid of a continuously operating mechanical kiln. 3,929,463, Cl. 75-37.000.

Swanson, Elmer G., to Hoerner Waldorf Corporation. Tray for strawberries and the like. 3,929,273, Cl. 229-34.00R.

Swarsab Mining, Exploration & Development Company (Proprietary) Limited: *See—*
Pittie, Willem Hubert; Overbeek, Gerhardus; and Doig, Kingsley Ferguson, 3,929,469.

Swered, Paul; and Girard, Mary Anne, to Betz Laboratories, Inc. Slimicidal compositions containing 2,2-dibromo-3-nitrilopropionamide and their use. 3,930,015, Cl. 424-298.000.

Swick, Edwin Grant: *See—*
Bury, George John; and Swick, Edwin Grant, 3,928,894.

Swift, Jean Drummond: *See—*
Hodgkin, Jonathan Howard; Hawthorne, David Geoffrey; Swift, Jean Drummond; and Solomon, David Henry, 3,929,502.

Swigert, Roger D., to Merck & Co., Inc. Method for preparing 2-bromo-2-bromomethyl-glutaronitrile. 3,929,858, Cl. 260-465.700.

Swinehart, Carl F., to Kewanee Oil Company. Grooved windows for scintillation crystals and light pipes of high refractive index. 3,930,160, Cl. 250-361.000.

Swiss Aluminum Ltd.: *See—*
Bretthauer, Klaus; and Simon, Erich, 3,929,073.

Syntex (U.S.A.) Inc.: *See—*
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,821.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,822.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,823.
Beard, Colin C.; Edwards, John A.; and Fried, John H., 3,929,824.

Szczesniak, Alina S.: *See—*
Shanbhag, Sudhakar P.; and Szczesniak, Alina S., 3,930,034.

Sze, Morgan C.: *See—*
Gelbein, Abraham P.; Sze, Morgan C.; and Paustian, John E., 3,929,811.

Szinai, Stephen S.: *See—*
Cashin, Colin H.; Chakrabarti, Jiban K.; and Szinai, Stephen S., 3,929,888.

Szonn, Bodo: *See—*
Muller, Heinz; and Szonn, Bodo, 3,930,102.

Szymber, Oleg; and Brushenko, Anatoli, to GAF Corporation. Toner apparatus for electrophotographic development. 3,929,099, Cl. 118-637.000.

Tabei, Kiyoshi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Taborsky, Robert G., to Ben Venue Laboratories, Inc. 3-Nitrohalosalicylanilides. 3,929,879, Cl. 260-559.00S.

Tachibana, Kyozaburo: *See—*
Arai, Haruhiko; Tachibana, Kyozaburo; Naganuma, Yoshinori; and Murata, Moriyasu, 3,929,680.

Tadokoro, Yoshio: *See—*
Shibata, Osamu; Kojimoto, Susumu; Sato, Takami; and Tadokoro, Yoshio, 3,929,951.

Tajiri, Kunio: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.

Takada, Juichiro, heir: *See—*
Takada, Takezo, deceased; and Takada, Juichiro, heir, 3,929,205.

Takada, Takezo, deceased; and by Takada, Juichiro, heir, to Takata Kojyo Co., Ltd. Three point safety belt system with inertia actuated inflatable belts. 3,929,205, Cl. 180-82.00C.

Takagi, Etuo: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.

Takagi, Yutaka: *See—*
Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, 3,930,029.

Takahashi, Masahiro: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Takahashi, Ricardo M., to Ampex Corporation. Low power, fast rise time current driver for inductive load. 3,930,171, Cl. 307-270.000.

Takahashi, Toshiro: *See—*
Sugiyama, Noboru; Takahashi, Masahiro; Kanamori, Hirosuke; Sato, Ken; Hirayama, Yoshio; Mikamo, Masahiro; Takahashi, Toshiro; Nagano, Toshihiro; Kaneda, Kazuyoshi; and Hara, Isao, 3,929,593.

Takano, Nobuyoshi; Sakai, Kaoru; Aoki, Satoshi; and Yasuda, Kazuo, to Hitachi, Ltd. Sample transfer device and method for analytical system. 3,929,411, Cl. 23-259.000.

Takasago Perfumery Co., Ltd.: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.

Takashima, Hiroshi: *See—*
Akasaki, Masato; Takashima, Hiroshi; and Shibata, Kazuhiro, 3,930,018.

Takashima, Mutsuo: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.

Takashima, Shunichi: *See—*
Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shindo, Mizuo; and Shimoshinbara, Yoshihiro, 3,929,728.

Chimura, Kazuya; Takashima, Shunichi; Nakazono, Ryuichi; Kawashima, Masao; Ota, Hiroyuki; Kaneko, Takashi; and Sakunaga, Kenichi, 3,930,103.
Takata Kojyo Co., Ltd.: *See*—
Takada, Takezo, deceased; and Takada, Juichiro, heir, 3,929,205.
Takatsu, Mitsumune: *See*—
Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, 3,930,029.
Takayama, Yuichiro: *See*—
Hattori, Hirotsugu; and Takayama, Yuichiro, 3,929,531.
Takeda Chemical Industries, Ltd.: *See*—
Kanzaki, Toshihiko; Fukita, Tadazumi; and Kono, Yoichiro, 3,929,577.
Oshiai, Michihiko; Ari, Osami; Morimoto, Akira; Okada, Taiiti; and Masuda, Katsutada, 3,929,775.
Takeuchi, Kazuhiko; and Matsumoto, Ryoichiro, to Yamatake-Honeywell Company, Ltd. Flowmeter for an open aqueduct. 3,929,016, Cl. 73-194.0EM.
Takeuchi, Tsuneo: *See*—
Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, 3,930,029.
Takeuchi, Tsutomu: *See*—
Kurata, Tokuzo; Emi, Satoshi; Ofuchi, Kunihiko; Takeuchi, Tsutomu; and Sone, Isamu, 3,929,963.
Taki Fertilizer Manufacturing Co., Ltd.: *See*—
Aiba, Yoshikazu; Furumori, Takaki; Shinpo, Shozo; and Funabiki, Kaoru, 3,929,666.
Takita, Kiyoshi: *See*—
Kimura, Ichiro; Sugiyama, Hironari; Takita, Kiyoshi; and Mizutani, Makoto, 3,929,452.
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, to Nippon Kayaku Kabushiki Kaisha. Process for removing copper from copper-containing bleomycin group antibiotics. 3,929,993, Cl. 424-177.000.
Talbot, Donald Thomas, to Eaton Corporation. High security lock. 3,928,992, Cl. 70-366.000.
Tallarovic, James F., to Babcock & Wilcox Company, The. Fuel atomizer. 3,929,290, Cl. 239-417.300.
Talty, Robert D.: *See*—
Burke, Noel I.; Dowell, Arthur M., Jr.; Talty, Robert D.; and Kremer, Kenneth J., 3,930,035.
Tamag Basel AG: *See*—
Beringer, Monique; and Buchmann, Paul, 3,929,141.
Tamarin, Bernard J.: *See*—
Cutler, Morris; and Tamarin, Bernard J., 3,929,210.
Tamaru, Akio: *See*—
Kurata, Tokuzo; Okano, Takeshi; Tamaru, Akio; Kato, Yozo; and Nagashima, Saburo, 3,929,881.
Tamura Electric Works, Ltd.: *See*—
Nishina, Rintaro, 3,930,131.
Tamura, Hifumi: *See*—
Kanomata, Ichiro; Doi, Hiroshi; and Tamura, Hifumi, 3,930,155.
Tamura, Zensuke: *See*—
Tanaka, Hirobumi; Arashi, Norio; Hishinuma, Yukio; and Tamura, Zensuke, 3,929,416.
Tanaka, Hirobumi; Arashi, Norio; Hishinuma, Yukio; and Tamura, Zensuke, to Hitachi, Ltd. Process and apparatus for producing gypsum lumps. 3,929,416, Cl. 23-260.000.
Tanaka, Katsuaki, to Iwatsu Electric Co., Ltd. Digital function fitter. 3,930,144, Cl. 235-150.530.
Tanaka, Kunihiko: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.
Tanaka, Tsutomu: *See*—
Izawa, Shinichi; Ozeki, Juro; Tanaka, Tsutomu; and Nakanishi, Atsuo, 3,929,930.
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.
Tang, Walter Kwei-Yuan: *See*—
Moore, Albert Lloyd; and Tang, Walter Kwei-Yuan, 3,929,934.
Tani, Tatsuo: *See*—
Inomata, Jihei; Hino, Seiichi; and Tani, Tatsuo, 3,929,914.
Tanigawa, Shizuhiko; Kikuya, Satoshi; Yamazoe, Yoshinori; and Nakamura, Chihiro, to Matsushita Electric Industrial Co., Ltd. Tape guiding drums of the magnetic recording and reproducing apparatus. 3,930,270, Cl. 360-130.000.
Tanimoto, Kenji: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.
Tanimoto, Tadashi; and Shibata, Kazuo, to Kanzaki Paper Manufacturing Company, Ltd. Electrostatic recording materials. 3,930,080, Cl. 427-411.000.
Tappan Company, The: *See*—
Perl, Richard L., 3,928,910.
Tarman, Paul B.: *See*—
Linden, Henry R.; Tarman, Paul B.; and Feldkirchner, Harlan L., 3,929,615.
Tarrson, E. B.; and Young, R., to John O. Butler Company. Device for inserting dental floss through interproximal areas and method of using same. 3,929,144, Cl. 132-93.000.
Tasaki, Akira: *See*—
Shirahata, Ryuji; Kitamoto, Tatsuji; Shimizu, Mahito; Tasaki, Akira; and Suzuki, Masaaki, 3,929,604.
Taska, Eileen R. Learning kit for children with learning disabilities. 3,928,924, Cl. 35-37.000.
Taskier, Henry T., to Celanese Corporation. Hydrophilic microporous film. 3,929,509, Cl. 136-146.000.
Tate, Philip Edward Russell: *See*—
Nowell, Roger; and Tate, Philip Edward Russell, 3,929,715.
Taub, Steven I., to Du Pont de Nemours, E. I., and Company. Dry collection of waste materials. 3,929,968, Cl. 423-242.000.
Taub, Willard M.: *See*—
Faget, Maxime A.; Petynia, William W.; and Taub, Willard M., 3,929,306.
Tavs, Peter: *See*—
Nienburg, Hans-Juergen; Kummer, Rudolf; Hohenschutz, Heinz; Strohmeyer, Max; and Tavs, Peter, 3,929,898.
Taylor, Eugene M. Remote monitor apparatus for meters. 3,930,245, Cl. 340-188.00R.
Taylor, George W.: *See*—
Zinn, Mortimer H.; Taylor, George W.; and Garoff, Kenton, 3,930,204.
Taylor, Rayner Walter: *See*—
Weaver, John; Maynard, David Payne; Taylor, Rayner Walter; and Bayliss, William Richards Gilbert, 3,929,377.
Tazuma, James J.; and Zadra, Mario D., to Goodyear Tire & Rubber Company, The. Maleic anhydride-modified resin backbone. 3,929,737, Cl. 260-78.40D.
Teac Corporation: *See*—
Uemura, Yasuhiro, 3,930,268.
Uemura, Yasuhiro, 3,930,269.
Teasley, Robert E., Jr.: *See*—
Bugelski, William G.; and Teasley, Robert E., Jr., 3,929,645.
Tec-Pak Corporation: *See*—
Warning, Walter B.; and Warning, Walter B., Jr., 3,930,043.
Technicon Instruments Corporation: *See*—
Adler, Stanford L., 3,929,646.
Tee-Pak, Inc.: *See*—
Burke, Noel I.; Dowell, Arthur M., Jr.; Talty, Robert D.; and Kremer, Kenneth J., 3,930,035.
Burke, Noel I., 3,930,036.
Teijin Limited: *See*—
Hashizume, Astuo; Tsuzuki, Ryuichiro; and Mizushima, Haruo, 3,930,079.
Kawase, Shoji; Maeda, Kenji; Kumakawa, Shiro; and Kuratsuji, Takatoshi, 3,929,180.
Teikoku Hormone Mfg. Co. Ltd.: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, 3,929,765.
Teknoflex Control System AB: *See*—
Comstedt, Tore Erik Karl, 3,929,039.
Tektronix Inc.: *See*—
Hoskins, David Orville, 3,930,259.
Telang, Yeshwant P.: *See*—
Rao, V. Durga Nageswar; and Telang, Yeshwant P., 3,930,071.
Teldix GmbH: *See*—
Leiber, Heinz, 3,929,380.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Bellanger, Maurice Georges; and Lepagnol, Guy Pierre, 3,930,147.
Teleflex Incorporated: *See*—
Kehm, Paul H., 3,929,032.
Webb, Grant A., 3,929,031.
Teller, Daniel M.; and Sellstedt, John H., to American Home Products Corporation. Certain cephalosporanic acid derivatives. 3,929,781, Cl. 260-243.00C.
Tenneco Chemicals, Inc.: *See*—
Minieri, Pasquale P., 3,929,705.
Terada, Masaki: *See*—
Minami, Junichi; Takatsu, Mitsumune; Terada, Masaki; Takeuchi, Tsuneo; and Takagi, Yutaka, 3,930,029.
Teranishi, Roy: *See*—
Leitereg, Theodore J.; Guadagni, Dante G.; and Teranishi, Roy, 3,929,894.
Terashima, Osamu; and Okabayashi, Ikuo, to Chiyoda Chemical Engineering and Construction Co., Ltd. Flexible sand drain formed in a casing. 3,928,979, Cl. 61-11.000.
Terrell, Ross C.; and Moore, George L., to Airco, Inc. Fluorodioxolane anesthetic compound and method. 3,930,013, Cl. 424-278.000.
Texaco Inc.: *See*—
Crouch, William B., 3,929,429.
Duranleau, Roger G.; and Larkin, John M., 3,929,845.
Mead, Theodore C.; Ashton, William B.; and Shillinglaw, John P., Jr., 3,929,616.
Nelson, Gerald V.; Youngblood, Douglas J.; and Colvert, James H., 3,929,668.
Pitts, Robert W., Jr., 3,930,152.
Scott, Hubert D., 3,930,153.
Scott, Hubert D., 3,930,154.
Seni, Leonard S.; Davis, James E.; and Harrison, Henry R., 3,929,652.
Texas Instruments, Corporation: *See*—
Bedenbender, John W.; and Kelly, Gilbert H., 3,929,206.
Texas Instruments Incorporated: *See*—
Senor, Ronald E., 3,930,215.
Th. Goldschmidt AG: *See*—
Rossmy, Gerd; and Koerner, Gotz, 3,929,649.

Thalen, Bror Arne: *See*—
Brattsand, Ralph Lennart; af Ekenstam, Bo Thuresson; Claeson, Karl Goran; and Thalen, Bror Arne, 3,929,768.

Thatcher, Russell S. Welding track positioning gauge. 3,928,919, Cl. 33-180.00R.

Thayer, William; Pageau, Lucien; and Sourirajan, Srinivasa, to Canadian Patents and Development Limited. Method for making tubular polymeric membranes for reverse osmosis. 3,929,945, Cl. 264-41.000.

Theissen, Robert J., to Mobil Oil Corporation. Herbicidal halophenoxy benzoic acid salts. 3,929,455, Cl. 71-115.000.

Thettu, Raghulinga R., to Xerox Corporation. Roll fuser. 3,929,094, Cl. 118-60.000.

Thettu, Raghulinga R., to Xerox Corporation. Roll fuser. 3,929,095, Cl. 118-60.000.

Thettu, Raghulinga R., to Xerox Corporation. Roll fuser. 3,929,096, Cl. 118-60.000.

Thiel, Max: *See*—
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Stork, Harald; and Schmidt, Felix Helmut, 3,929,763.
Popelak, Alfred; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Sponer, Gisbert, 3,929,793.

Thing, Frank. Exhaust backpressure warning system. 3,930,221, Cl. 340-52.00R.

Thiokol Corporation: *See*—
Macbeth, Albert W., 3,928,965.

Thoma, Matthias. Process for the conversion of sodium sulfite. 3,929,964, Cl. 423-183.000.

Thomas, Frederick L. High water-content water in oil emulsion. 3,929,499, Cl. 106-268.000.

Thomas, Jean-Claude; Raoul, Pierre; and Ledoux, Claude, to Rhone-Progil. Artificial underwater habitats. 3,929,100, Cl. 119-2.000.

Thomas, Robert: *See*—
Hadni, Armand; and Thomas, Robert, 3,930,240.

Thompson, Hugh Ansley, to Procter & Gamble Company, The. Absorptive structure having tapered capillaries. 3,929,135, Cl. 128-287.000.

Thompson, Wallace M., to Harris Press & Shear Corporation. Closed chamber baler. 3,929,062, Cl. 100-3.000.

Thomson-CSF: *See*—
Gerlach, Pierre; and Hoet, Roger, 3,930,179.

Thore, Thomas J., to Glenoit Mills, Inc. Adjustable doffer support for high pile fabric knitting machines. 3,928,986, Cl. 66-9.00B.

Thorn Electrical Industries Limited: *See*—
Coaton, James Richard, 3,930,178.

Thuillier, Rene: *See*—
Christen, Gilbert; Favre, Bernard; Marze, Xavier; Salmon, Michel; and Thuillier, Rene, 3,930,105.

Thurston, Franklin J.; Schendeler, Franciscus J.; and Jounen, Joseph C., to Fairchild Industries, Inc. Article transferring apparatus. 3,929,217, Cl. 198-23.000.

Thyret, Helmut Eugen, to Consortium fur Elecktrochemische Industrie GmbH. Process for producing vinyl pyridine compounds. 3,929,799, Cl. 260-290.00V.

Time Computer, Inc.: *See*—
Reese, Robert O., 3,928,960.

Timex Corporation: *See*—
Pyne, Bernard; and Liddle, Robert, 3,929,265.

Timms, Alan R., to Sandoz-Wander, Inc. (Sandoz, Inc.). Imidazo(2,1-A)isoindoles as hypolipidemics. 3,930,009, Cl. 424-273.000.

Timofeev, Valentin Vyacheslavovich: *See*—
Zlotin, Boris Nikolaevich; Timofeev, Valentin Vyacheslavovich; and Chernenko, Sergei Vladimirovich, 3,929,008.

Titanium Technology, N.V.: *See*—
Dunn, Wendell E., Jr., 3,929,501.

Tjernstrom, Ove, to Allmanna Svenska Elektriska Aktiebolaget. Method and means for measuring the clamping force on transformer windings. 3,929,010, Cl. 73-141.00R.

Todd, Lamar S.; Fitzgibbon, Alan; Carosella, Michael C.; and Hilty, Donald C., to Union Carbide Corporation. Desulfurization of molten ferrous metals. 3,929,464, Cl. 75-58.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Amemiya, Hiroshi, 3,930,256.
Hara, Satoshi; Akino, Morio; and Nakagawa, Keizo, 3,929,298.

Tombu, Gerard J. Device for fastening wall covering fabrics. 3,928,897, Cl. 24-243.00K.

Tomey, Thomas C.: *See*—
van der Gaag, Gerrit; and Tomey, Thomas C., 3,929,953.

Tomlin, Clive Dudley Spencer: *See*—
Barlow, Charles Brian; and Tomlin, Clive Dudley Spencer, 3,930,007.

Tong, David W.: *See*—
Johansen, Inge; and Tong, David W., 3,930,113.

Tong, Wen-Hong: *See*—
Steward, David L.; and Tong, Wen-Hong, 3,929,991.

Topham, Arthur: *See*—
Morris, Cyril; and Topham, Arthur, 3,929,405.

Tornabene, Michael G. Wave-action power apparatus. 3,930,168, Cl. 290-53.000.

Torres, Hector Jose, to Aurelio, Leonardo Francisco, a part interest. Metal rod for reinforced concrete and process for producing said rod. 3,928,998, Cl. 72-185.000.

Tosti, Umberto V.; and Childs, Richard L., to Rockwell International Corporation. Fail safe stop motion for looms. 3,929,171, Cl. 139-336.000.

Toth, Anton; Rupp, Hans-Dieter; and Meyer, Gerhard, to Akzo N.V. of Arnhem, Holland. Process for the production of thiocarbohydrazide. 3,929,877, Cl. 260-552.0SC.

Toy Development Limited: *See*—
Hayes, Geoffrey, 3,929,337.

Toyo Kogyo Co., Ltd.: *See*—
Sasame, Takao; Shigeta, Toshihiko; and Yamada, Toshio, 3,929,596.

Toyo Seikan Kaisha Limited: *See*—
Komatsu, Yoshihiro; Kakuta, Izumi; and Yamaguchi, Kanemichi, 3,930,041.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Goto, Kenji; and Mitsui, Ryozo, 3,928,966.

Traille, Andre: *See*—
Lutz, Jean; Traille, Andre; and Besnard, Francois, 3,929,009.

Transco Inc.: *See*—
Urban, Raymond W., 3,929,207.

Transfer Systems Incorporated: *See*—
Jones, Cecil R.; Yoli, Alfred H.; and Kirk, William F., 3,929,570.

TransFRESH Corporation: *See*—
Woodruff, Richard E., 3,930,040.

Transyt Corporation: *See*—
McRae, William V., Jr.; and Stuart, John J., Jr., 3,929,076.

Tregoning, Robert L. Lug nut wrench tool. 3,928,877, Cl. 7-1.00G.

Treptow, Arnold W.: *See*—
Smith, Baynard R.; and Treptow, Arnold W., 3,929,491.

Tress, Jack E.; and Hunter, Willard L., to United States of America, Interior. Charging an electric furnace. 3,929,459, Cl. 75-12.000.

Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 3-Heterothio derivatives of 1-(thioalkoxycarbonyl)thioacetyl]cephalosporins. 3,929,776, Cl. 260-243.00C.

Treuner, Uwe D.: *See*—
Breuer, Hermann; and Treuner, Uwe D., 3,929,778.

Triax Company, The: *See*—
Atwater, Wayne G., 3,928,905.

Trimble, Robert A.: *See*—
Button, Harold O.; and Trimble, Robert A., 3,929,626.

Trocino, Frank S., to Bohemia Inc. Slow nitrogen releasing fertilizers and methods of making the same. 3,929,446, Cl. 71-23.000.

Troike, Robert L.: *See*—
Rosen, Arye; and Reynolds, James Francis, 3,930,206.

Troponwerke Dinklage & Co.: *See*—
Becker, Karl Heinz; Boltze, Karl-Heinz; Dell, Hans-Dieter; and Seidel, Peter-Rudolf, 3,930,003.

Trostyanskaya, Irina Ivanovna: *See*—
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.

Tsagas, Nicolas Fotios, to Kalogeropoulos, Alexis, a part interest. Apparatus for indicating pneumatic tire pressure. 3,930,223, Cl. 340-58.000.

Tsuchiya, Osamu: *See*—
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,929,762.

Tsuchiya, Tsutomu: *See*—
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, 3,929,761.

Tsuchiya, Yutaka: *See*—
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.

Tsuji, Nobuo: *See*—
Kubotera, Kikuo; Mizuki, Eiichi; Fujiwara, Tadahiro; and Tsuji, Nobuo, 3,929,481.

Tsukamoto, Kunio: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Tsukamoto, Kunio; Hiramatsu, Yoshio; and Miyasaka, Katsuhiko, 3,929,765.

Tsukiyasu, Tadashi: *See*—
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 3,929,612.

Tsuzimura, Katsuhiko: *See*—
Izawa, Shinichi; Tsuzimura, Katsuhiko; Mizushiro, Ken; Ozeki, Juro; Sugawara, Yoshiaki; Tanaka, Tsutomu; and Nakanishi, Astuo, 3,929,931.

Tsuzuki, Ryuichiro: *See*—
Hashizume, Astuo; Tsuzuki, Ryuichiro; and Mizushima, Haruo, 3,930,079.

Tucker, Harold; and Minchak, Robert J., to B. F. Goodrich Company, The. Sulphur vulcanizable elastomeric copolymers. 3,929,746, Cl. 260-80.780.

Tuller, Harold W.: *See*—
Curtis, Omer E., Jr., Tuller, Harold W.; O'Neill, Charles T.; and Nussbaum, Ralph W., 3,929,738.

Tunick, Allen Abraham: *See*—
Fuhrmann, Robert; Sifniades, Stylianos; and Tunick, Allen Abraham, 3,929,885.

Turk, Chester Frank: *See*—
Krapcho, John; and Turk, Chester Frank, 3,929,783.

Turkiewicz, Richard R.; and Volino, Anthony J., to United States of America, Army. Vehicle track support. 3,929,385, Cl. 305-56.000.

Turner, James Keith; and Parsons, Gary L., to Gaston County Dyeing Machine Company. Filtering apparatus and process. 3,929,639, Cl. 210-71.000.

Turner, Larry G.: *See—*
Cohn, Lawrence P.; Crawford, Dennis W.; and Turner, Larry G., 3,929,317.
Turner, Robert Bruce, to American Medical Electronics Corporation. Probe system. 3,929,018, Cl. 73-343.00R.
Turner, Robert K.; and Rose, Edgar, to Outboard Marine Corporation. Fuel feed system for recycling fuel. 3,929,111, Cl. 123-73.00R.
Tybus, Axel W.; and Fabrizio, Leonard A., to Hooker Chemicals & Plastics Corporation. Polyvinyl chloride composition. 3,929,700, Cl. 260-23.0XA.
Uchida, Minoru: *See—*
Orito, Zen-Ichi; Uchida, Minoru; and Mori, Noriaki, 3,929,946.
Uchiyama, Yoshio: *See—*
Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, 3,929,903.
Uden, Edward; and Gotze, Bengi, to U.S. Philips Corporation. Electric component assembly comprising insulating foil bearing conductor tracks. 3,930,115, Cl. 174-52.0FP.
Ueda, Yuji: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.
Uemura, Yasuhiro, to Teac Corporation. Cassette tape deck with brake and tape tensioning means. 3,930,268, Cl. 360-96.000.
Uemura, Yasuhiro, to Teac Corporation. Cassette tape deck with tape tensioning. 3,930,269, Cl. 360-96.000.
Ueyama, Michio: *See—*
Noguchi, Teruhisa; Hashimoto, Yoshinobu; Uchiyama, Yoshio; and Ueyama, Michio, 3,929,903.
Uher Werke Munich: *See—*
Plener, Helmut, 3,930,267.
Uhlig, Heinz Oskar: *See—*
Knipstrom, Karl-Erik; Uhlig, Heinz Oskar; and Boden, Knut Folke Ingemar, 3,930,138.
Ukaji, Rokuo: *See—*
Komo, Tetsuya; Mizobata, Satoshi; Ukaji, Rokuo; and Kamihigoshi, Tutomu, 3,929,920.
Uke, Alan K. Diver's air tank protective cap. 3,929,312, Cl. 248-346.100.
Ullmann, Agnes; and Schwartz, Maxime, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process for the microbiological purification of dairy effluents. 3,930,028, Cl. 426-41.000.
Umehara, Seichiro: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 3'-Deoxy derivatives of neamine and its related aminoglycosidic antibiotics, and the production thereof. 3,929,762, Cl. 260-210.0AB.
Umezawa, Hamao: *See—*
Takita, Tomohisa; Fujii, Akio; Muraoka, Yasuhiko; Mizuguchi, Shigeru; and Umezawa, Hamao, 3,929,993.
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, 3,929,761.
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 3-Deoxykanamycin. 3,929,761, Cl. 260-210.00K.
Umezawa, Sumio: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,929,762.
Umina, Anthony P.: *See—*
Harris, Norman E.; Umina, Anthony P.; and Westcott, Donald E., 3,930,032.
Uni-Cardan AG: *See—*
Girguis, Sobhy Labib, 3,928,985.
Uni-Mist, Inc.: *See—*
Boelkins, Wallace G., 3,929,161.
Unicord, Incorporated: *See—*
Kosinski, Frank J., 3,930,207.
Uniflex S.p.A.: *See—*
Brusadin, Giacomo; and Prosdocimo, Giordano, 3,929,288.
Uniloc, Inc.: *See—*
Porter, Joe A., 3,929,603.
Union Camp Corporation: *See—*
Bolling, Robert W.; and Reeves, Jerry H., 3,929,275.
Union Carbide Corporation: *See—*
Boszor, Samuel M., 3,930,130.
Brown, Earle S., 3,929,969.
Clendinning, Robert A.; Potts, James E.; and Gorham, William F., 3,929,937.
Kotval, Peshotan S.; Hatwell, Henri; and Gortsema, Frank P., 3,929,427.
Todd, Lamar S.; Fitzgibbon, Alan; Carosella, Michael C.; and Hilty, Donald C., 3,929,464.
Union Laitiere Vaudoise: *See—*
Pfister, Bernard, 3,929,890.
Union Oil Company of California: *See—*
Ward, John W., 3,929,672.
Uniroyal, Inc.: *See—*
Wolf, Harold G., Jr.; and Hlavacek, Robert A., 3,929,928.
Unistrut Corporation: *See—*
Attwood, Warren R., 3,928,930.
United Kingdom Atomic Energy Authority: *See—*
Dent, Kenneth Henry; and Challender, Ronald Scott, 3,929,007.
Strong, Robert Edmund, 3,929,961.
United States of America
Agriculture: *See—*
Freedman, Bernard; and Diamond, Martin J., 3,929,723.
Leitereg, Theodore J.; Guadagni, Dante G.; and Teranishi, Roy, 3,929,894.
Schuller, Walter H., 3,929,634.
Severson, Ray F.; Schuller, Walter H.; Joye, N. Mason, Jr.; and Lawrence, Ray V., 3,929,755.
Ward, Truman L.; and Benerito, Ruth R., 3,929,535.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,037.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., 3,930,038.
Air Force: *See—*
Goodrum, John W., 3,929,557.
Sicree, Albert J.; and Arnold, Fred E., 3,929,832.
Army: *See—*
Chang, Leroy L.; Esaki, Leo; and Ludeke, Rudolf, 3,929,527.
Einberg, Fred J., 3,929,684.
Harris, Norman E.; Umina, Anthony P.; and Westcott, Donald E., 3,930,032.
Kittl, Emil, 3,929,510.
Lee, S. Yen, 3,929,717.
Pasiuk, Walter T., 3,930,085.
Turkiewicz, Richard R.; and Volino, Anthony J., 3,929,385.
Zinn, Mortimer H.; Taylor, George W.; and Garoff, Kenton, 3,930,204.
Energy Research and Development Administration: *See—*
Abraham, Bernard M.; and Schreiner, Felix, 3,929,980.
Asprey, Larned B.; and Paine, Robert T., Jr., 3,929,601.
Bamberger, Carlos E.; Richardson, Donald M.; and Grimes, Warren R., 3,929,979.
Grimmett, Earl S., 3,929,585.
General Counsel-Code GP: *See—*
Faget, Maxime A.; Petynia, William W.; and Taub, Willard M., 3,929,306.
Haley, Claude T., 3,929,364.
Sabol, Alexander P., 3,929,305.
Interior: *See—*
Schwartz, Murray Arthur; and Llewellyn, Thomas Oscar, 3,929,947.
Siemens, Richard E.; and Good, Philip C., 3,929,468.
Tress, Jack E.; and Hunter, Willard L., 3,929,459.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Shriver, Edward L.; and Igenbergs, Eduard B. Self-energized plasma compressor. 3,929,119, Cl. 124-1.000.
Navy: *See—*
Armstrong, John H.; and Wassmann, William W., 3,929,308.
Beane, Theodore E.; and Kirsch, Alan L., 3,929,075.
Greene, Michael L.; and Moss, George J., 3,929,015.
Horn, George M., 3,929,533.
Kardon, Samuel; and Curry, Carlton J., 3,929,289.
Lewis, Charles A., 3,929,055.
Means, Robert W., 3,930,255.
Merz, William Carl, 3,929,508.
Ohr, Jack; and Clark, Kenneth G., 3,929,521.
Parker, Roy B., 3,929,407.
San Miguel, Anthony, 3,929,074.
Yablonski, Michael E.; and Nichparenko, John, 3,929,124.
Zapf, Donald C., 3,929,072.
U.S. Philips Corporation: *See—*
Druyvesteyn, Willem Frederik; and Dorleijn, Jan Willem Frederik, 3,930,242.
Gorrissen, Jan, 3,930,067.
Nicholas, Keith Harlow; Ford, Ronald Alfred; and Beale, Julian Robert Anthony, 3,929,512.
Salters, Roelof Herman Willem; Boonstra, Lieuwe; and Lambrechtse, Cornelis Willem, 3,930,239.
Schmidt, Rolf; Carl, Klaus; Gustin, Pol Ambroise Ghislain Joseph; and Schayes, Raymond Georges, 3,930,119.
Uden, Edward; and Gotze, Bengi, 3,930,115.
van der Wal, Davis Josephus, 3,929,052.
van Leeuwen, Johannes Aloysius, 3,930,180.
U. S. Radium Corporation: *See—*
Robinson, Alfred; Schatz, Joseph S.; and Katz, Leonhard, 3,930,165.
United States Steel Corporation: *See—*
Albright, Denton M.; and Leach, Charles Willard, 3,930,025.
Myers, Henry F., 3,930,075.
United Systems Corporation: *See—*
Storar, Robert C., 3,930,252.
United Technologies Corporation: *See—*
Jakobsen, Karl Severin; and Nadeau, Victor Joseph, 3,929,956.
Universal Identification Systems, Inc.: *See—*
Byrne, John A.; and Rhea, Charles K., Jr., 3,929,277.
Universal Oil Products Company: *See—*
Alkasab, Kalil A., 3,929,122.
Antos, George J., 3,929,683.
Gattuso, Marion J., 3,929,655.
Hervert, George L., 3,929,912.
Hogan, Gerard T.; and Weik, Kirby B., 3,929,374.
Rosback, Donald H.; and Neuzil, Richard W., 3,929,669.
Wilks, Alan D., 3,930,072.
Zabransky, Robert F., 3,929,926.

Upjohn Company, The: *See—*
Alberino, Louis M.; and Farrissey, William J., Jr., 3,929,733.
Alberino, Louis M.; Farrissey, William J., Jr.; and Rose, James S., 3,930,097.
Kaugars, Girts, 3,930,020.
Kaugars, Girts, 3,930,021.
Morozowich, Walter, 3,929,862.
Pike, John E.; and Schneider, William P., 3,929,861.
Shah, Tilak M., 3,929,732.
Youngdale, Gilbert A., 3,930,012.

Urakami, Teizi, to Mitsubishi Gas Chemical Co., Ltd. Process for cultivating ethanol-assimilating yeasts. 3,929,578, Cl. 195-49.000.

Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having a shutter mechanism controlled to remain closed as a failure warning. 3,930,263, Cl. 354-268.000.

Urayama, Takao: *See—*
Katagiri, Yoshiaki; Urayama, Takao; and Mori, Masaji, 3,929,546.

Urban, John A.; and Hopkins, Gary Lee, to Eaton Corporation. Skid control system including a relay compensator valve for rapid brake pressure re-application followed by slower rate of pressure re-application. 3,929,383, Cl. 303-21.00F.

Urban, John A.: *See—*
McNinch, Joseph H., Jr.; Urban, John A.; and Hopkins, Gary L., 3,929,382.

Urban, Raymond W., to Transco Inc. Ventilated acoustical cover. 3,929,207, Cl. 181-198.000.

Urmston, Hugh C., to Aluminum Company of America. Container wall with rupturable weakening line. 3,929,251, Cl. 220-268.000.

Uskokovic, Milan Radoje: *See—*
Gutzwiller, Juerg Albert Walter; and Uskokovic, Milan Radoje, 3,929,795.

USM Corporation: *See—*
Day, John T.; and Hollick, John G., 3,929,949.

Vacuum Cleaner Corporation of America, The: *See—*
Cutler, Morris; and Tamarin, Bernard J., 3,929,210.

Vago, Paul: *See—*
Cohen, Hyman; Vago, Paul; and Skender, Davorin, 3,930,129.

Vakaleris, Demetrius G.: *See—*
Hynes, John T.; and Vakaleris, Demetrius G., 3,929,892.

Valdo, Alex R., to Ethyl Corporation. Foamed metal bodies. 3,929,425, Cl. 29-191.000.

Valeev, Artur Khadyevich: *See—*
Filatov, Nikolai Grigorievich; Meshkov, Jury Yakovlevich; Chernenko, Nikolai Fedorovich; Nikonenko, Dmitry Iosifovich; Mashlenko, Felix Isaakovich; Belyaev, Albert Mikhailovich; Valeev, Artur Khadyevich; Savina, Valentina Alexandrovna; Marchenko, Vladimir Zakharovich; Fedorov, Valery Ionovich; Gridnev, Vitaly Nikiforovich; and Mikhailov, Konstantin Vasilievich, 3,929,524.

Valis, Jaroslav, to Allmanna Svenska Elektriska Aktiebolaget. Means for determining frequency. 3,930,199, Cl. 324-78.00D.

Vallak, Enn: *See—*
Vallak, Hannes, 3,929,183.

Vallak, Hannes, to Vallak, Enn. Method for sealed system of hot tops, ingot moulds or a combination of ingot mould and hot top and an arrangement for said sealed system. 3,929,183, Cl. 164-123.000.

Valyi, Emery I. Method for the production of composite containers. 3,929,954, Cl. 264-97.000.

Vance, Bess L.: *See—*
Stern, William R.; Jansen, Malcolm L.; and Vance, Bess L., 3,929,598.

van der Gaag, Gerrit; and Tomey, Thomas C., to Shell Oil Company. Method for forming noncircular thermoplastic cupped articles. 3,929,953, Cl. 264-94.000.

van de Rovaart, Paul; and Wuhrmann, Jean-Jacques, to Societe d'Assistance Technique pour Produits Nestle S.A. In situ production of meat like flavor in expanded porous food product. 3,930,044, Cl. 426-533.000.

van der Wal, Davis Josephus, to U.S. Philips Corporation. Electronic musical instrument with one tone generator controlling a second tone generator. 3,929,052, Cl. 84-1.220.

van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., to Stamicarbon N.V. Process for the preparation of a phenol from a benzenemonocarboxylic acid. 3,929,909, Cl. 260-621.00R.

van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., to Stamicarbon N.V. Preparation of a phenol from a benzenemonocarboxylic acid. 3,929,911, Cl. 260-621.00R.

Van Dyck, Emil J.; Malina, Jerry L.; and Schiller, Raymond E., to Dart Industries Inc. Pressure laminating method. 3,929,545, Cl. 156-220.000.

van Gils, Gerard E.; and Kalafus, Edward F., to General Tire & Rubber Company, The. Composite of rubber bonded to glass fibers. 3,930,095, Cl. 428-251.000.

VanHeuman, Frederick. Combination electrical cable cutters, strippers and pliers. 3,928,878, Cl. 7-5.500.

van Kempen, Charles, to Simplex Specialty Co., Inc. Film sleeving apparatus. 3,929,553, Cl. 156-391.000.

van Leeuwen, Johannes Aloysius, to U.S. Philips Corporation. Color cathode ray tube magnetic pole piece support structure. 3,930,180, Cl. 313-417.000.

van Mill, Johannes G.: *See—*
Whiteing, Roland G.; and van Mill, Johannes G., 3,930,224.

van Wijngaarden, Ineke: *See—*
Janssen, Paul Adriaan Jan; van Wijngaarden, Ineke; and Soudijn, Willem, 3,929,801.

Vargiu, Silvio: *See—*
Nistri, Ugo; Parodi, Antonio; and Vargiu, Silvio, 3,929,696.

Varian Associates: *See—*
Gerlach, Robert L.; and Rossini, George, 3,930,163.
LLewellyn, Peter M., 3,929,003.

Vasishth, Ramesh C., to Cor Tech Research Limited. Processes for making composite rice hull-resin articles, products thereof, processes for making resin-coated rice hulls and products thereof. 3,930,089, Cl. 428-212.000.

Vater, Wulf: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 3,929,798.

Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Levin, Alfred A., 3,929,830.

Vence, Thomas D.: *See—*
Denevi, Pietro G.; DiDuca, Mark B.; Slane, Billy J.; and Vence, Thomas D., 3,929,628.

Venkatesan, Peruvemba Swaminatha: *See—*
Oldis, John Edward; and Venkatesan, Peruvemba Swaminatha, 3,928,995.

Venturello, Carlo, to Montecatini Edison S.p.A. 1N, 1N'-Phenylenbis(5-methyl-4-pyrazolin-3-ones) and process for preparing same. 3,929,827, Cl. 260-310.00A.

Vepa Aktiengesellschaft: *See—*
Fleissner, Heinz, 3,928,920.

Vercon Products, Inc.: *See—*
Murphy, Wesley T., 3,928,951.

Vereinigte Osterreichische Eisen-und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Filter, Walther; and Filter, Claus, 3,929,168.
Riegler, Ernst; and Schmidt, Manfred, 3,929,389.

Veres, Frank, to Owens-Illinois, Inc. Sealant for glass-ceramic surfaces. 3,929,494, Cl. 106-40.00R.

Vernon, Lonnie W.: *See—*
Koh, Kwang K.; Pennington, Robert E., Vernon, Lonnie W.; and Nahas, Nicholas C., 3,929,631.

Verrill, Richard. Coin-operated timer utilizing measurement of absolute capacitance for coin testing. 3,929,213, Cl. 194-100.00A.

Veutgen, Hans-Jurgen: *See—*
Beyer, Horst; and Veutgen, Hans-Jurgen, 3,929,181.

Vezina, Claude: *See—*
Sehgal, Surendra N.; Blazekovic, Teodora M.; and Vezina, Claude, 3,929,992.

Victor Company of Japan, Limited: *See—*
Morita, Akiyoshi; and Enami, Tomotada, 3,930,122.

Viehe, John S. Self pressurized portable container for liquids. 3,929,262, Cl. 222-210.000.

Villari, Frank K., to Kendall Company, The. Liquid receiving device. 3,929,412, Cl. 23-259.000.

Villers, Philippe, to Computervision Corporation, The. Method for automating the production of engineering documentation utilizing an integrated digital data base representation of the documentation. 3,930,237, Cl. 340-172.500.

Vinals, Joaquin F.: *See—*
Chappell, Robert L.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred H., 3,929,676.

Vincent, David N., to Champion International Corporation. Inorganic pigment-loaded polymeric microcapsular system. 3,930,101, Cl. 428-326.000.

Visman, Jan; and Hamza, Hassan A., to Canadian Patents and Development Limited. Method and apparatus for centrifugally separating finely divided solids from aqueous suspensions thereof. 3,929,633, Cl. 210-49.000.

Vista Chemical & Fiber Products Inc.: *See—*
Denevi, Pietro G.; DiDuca, Mark B.; Slane, Billy J.; and Vence, Thomas D., 3,929,628.

Vock, Manfred H.: *See—*
Chappell, Robert L.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred H., 3,929,676.

Voegeli, Otto, to International Business Machines Corporation. Bubble domain lattice buffer arrangement. 3,930,244, Cl. 340-174.0TF.

Vogel, Christian: *See—*
Rathgeb, Paul; Vogel, Christian; and Weiss, Anton G., 3,929,816.

Vogele, Gunther: *See—*
Buchner, Norbert; Liede, Dieter; Schmeer, Peter; and Vogele, Gunther, 3,929,409.

Volino, Anthony J.: *See—*
Turkiewicz, Richard R.; and Volino, Anthony J., 3,929,385.

Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich. Process for the production of polymeric acetals containing urethane, carbamide and amide groups. 3,929,731, Cl. 260-77.50B.

Volkswagenwerk Aktiengesellschaft: *See—*
Klebba, Horst, 3,929,361.
Renger, Udo, 3,929,107.

Von den Hoff, Johan P. H.: *See—*
van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., 3,929,909.
van Dierendonck, Laurentius L.; and Von den Hoff, Johan P. H., 3,929,911.

von der Crone, Jost: *See—*
Pugin, Andre; Burdeska, Kurt; and von der Crone, Jost, 3,929,719.

Vons, Leonard Hendrik: *See—*
Piepers, Gijsbrecht Gerhardus; and Vons, Leonard Hendrik, 3,929,569.
VRC California, Inc.: *See—*
Kimura, Noboru, 3,930,265.
Vydec, Inc.: *See—*
Blejwas, Walter T., Jr.; and Dickinson, Peter D., 3,930,250.
Vyskumny ustav stavebnich hmot: *See—*
Rosa, Josef; and Petr, Vlastimil, 3,929,417.
W. R. Grace & Co.: *See—*
Burrell, William E., 3,928,938.
Guenst, William C., Jr.; and Litschi, Gerold, 3,929,046.
Kim, Gwan; and Ernest, Michael Vance, 3,929,965.
Lussier, Roger J.; Magee, John Storey, Jr.; and Albers, Edwin Wolf, 3,929,621.
Marans, Nelson S.; and Gluecksmann, Alfred, 3,929,927.
Parthasarathy, R.; and Scherzer, Julius, 3,929,620.
Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., 3,929,574.
W. Schlafhorst & Co.: *See—*
Zumfeld, Heinz; Rutten, Hermann; and Bhattacharya, Nishit, 3,929,297.
Wacker-Chemie GmbH: *See—*
Kratel, Gunter; Patzke, Jorg; and Wegehaupt, Karl-Heinrich, 3,929,718.
Wada, Hiroyuki; Kawakami, Yasumasa; and Kamihigoshi, Tutomu, to Daikin Kogyo Co., Ltd. ε-Aluminum fluoride by evaporating aqueous MF solution of AlF_3 under vacuum to dryness and heating. 3,929,415, Cl. 23-305.000.
Waeschle Maschinenfabrik GmbH: *See—*
Krambrock, Wolfgang, 3,929,379.
Waggoner, Michael L.: *See—*
Richardson, Bart D.; and Waggoner, Michael L., 3,928,903.
Wagner, Eckhard, to Norddeutsche Schleifmittel-Industrie Christiansen & Co. Hollow body grinding materials. 3,928,949, Cl. 51-401.000.
Wagner, Sepp: *See—*
Gehrig, Heinz; Linge, Hermann; and Wagner, Sepp, 3,929,542.
Wahl, James A.: *See—*
Keene, Derek K.; and Wahl, James A., 3,929,346.
Wainer, Eugene; and Quaintance, Harold J., to Horizons Incorporated, a division of Horizons Research Incorporated. Metal-plated images formed by bleaching silver images with alkali metal hypochlorite prior to metal plating. 3,929,483, Cl. 96-38.400.
Waldeck, Gunther J., to A. B. Dick Company. Bookbinding tape. 3,930,082, Cl. 428-255.000.
Waldmann, Karl, to Hoechst Aktiengesellschaft. Bunte salts containing fluoro-alkyl groups. 3,929,854, Cl. 260-458.000.
Walk, Charles R.: *See—*
Gore, Jon S.; and Walk, Charles R., 3,929,504.
Walker-Hall-Sears, Inc.: *See—*
Hall, Ernest M., Jr., 3,930,216.
Hall, Ernest M., Jr., 3,930,218.
Walker, Loren H., to General Electric Company. Inverter control circuit. 3,930,194, Cl. 321-11.000.
Walker, Loren H.: *See—*
Park, John N.; Steigerwald, Robert L.; and Walker, Loren H., 3,930,196.
Walkington, Colin, to Masson Scott Thrissell Engineering Limited. Apparatus for forming and handling reels of paper or like material. 3,929,299, Cl. 242-65.000.
Wall, Albert. Barber's glove and method. 3,928,871, Cl. 2-161.00R.
Wallace, Kenneth A.: *See—*
Burens, James H.; and Wallace, Kenneth A., 3,930,170.
Wallach, Steven J.; Deerfield, Alan J.; and Nissen, Stanley M., to Raytheon Company. Format insensitive digital computer. 3,930,232, Cl. 340-172.500.
Walton, Roger J.; and Mills, Kenneth R., to Phillips Petroleum Company. Foamed flame retardant polyolefin compositions of improved physical strength. 3,929,689, Cl. 260-2.5HA.
Walworth, Bryant Leonidas, to American Cyanamid Company. Pyrazolium fungicides. 3,930,011, Cl. 424-273.000.
Walworth, Bryant Leonidas: *See—*
Cross, Barrington; and Walworth, Bryant Leonidas, 3,929,451.
Wang, Chih-Chung, to Kennecott Copper Corporation. Electroformation of metallic strands. 3,929,610, Cl. 204-13.000.
Wanner, Karl; Hahner, Reinhard; Schmid, Wolfgang; Hansel, Gernot; Bleicher, Manfred; and Falchle, Jorg, to Robert Bosch G.m.b.H. Quick-release tool chuck. 3,929,343, Cl. 279-1.00B.
Ward, John W., to Union Oil Company of California. Ammonia-stable Y zeolite compositions. 3,929,672, Cl. 252-455.00Z.
Ward, Truman L.; and Benerito, Ruth R., to United States of America, Agriculture. Color reversible, mirror surface glassy materials from plumbite-treated cellulosics. 3,929,535, Cl. 156-82.000.
Warfel, Mark. Horseshoeing method and nail. 3,929,194, Cl. 168-23.000.
Warning, Walter B.; and Warning, Walter B., Jr., to Tec-Pak Corporation. Method for making cotton candy. 3,930,043, Cl. 426-515.000.
Warning, Walter B., Jr.: *See—*
Warning, Walter B.; and Warning, Walter B., Jr., 3,930,043.
Warren, George H.; and Hurtig, Gunnar, III, to Baldwin Electronics, Inc. Tone detector. 3,930,127, Cl. 179-84.0VF.
Warren, Ivan Van. Snow machine. 3,929,199, Cl. 180-14.00R.
Warren, William H., to Henningsen Foods, Inc. Article transfer and spacer means. 3,929,234, Cl. 214-1.0BV.
Wartian, George, to Wartian Lock Company. Combination bracket and elastomeric element therefor. 3,928,889, Cl. 16-74.000.
Wartian Lock Company: *See—*
Wartian, George, 3,928,889.
Washington University: *See—*
Margraf, Harry W., 3,930,000.
Wassmann, William W.: *See—*
Armstrong, John H.; and Wassmann, William W., 3,929,308.
Watton, Rex, to British Secretary of State for Defence. Pyroelectric camera tube systems. 3,930,157, Cl. 250-330.000.
Wave Energy Systems Inc.: *See—*
Boucher, Raymond Marcel Gut, 3,929,662.
Wavin B.V.: *See—*
Kiezebrink, Willem, 3,929,554.
Weaver, John; Maynard, David Payne; Taylor, Rayner Walter; and Bayliss, William Richards Gilbert, to Cement and Concrete Association, The. Vehicle-mounted hardened concrete grooving machine. 3,929,377, Cl. 299-39.000.
Weaver, Thomas Dean, to Du Pont de Nemours, E. I., and Company. Dye intermediates. 3,929,772, Cl. 260-240.400.
Webb, Grant A., to Teleflex Incorporated. Clutch lock. 3,929,031, Cl. 74-501.00R.
Webb, Norval Ellsworth, Jr., to Richardson-Merrell Inc. Anhydrous candicidin foam compositions. 3,929,985, Cl. 424-45.000.
Weber, Heinrich: *See—*
Streck, Roland; and Weber, Heinrich, 3,929,850.
Weckler, Gerhard: *See—*
Engelhardt, Fritz; Gunzert, Willi; Jalke, Hellmut Georg; Ribka, Joachim; and Weckler, Gerhard, 3,929,740.
Wegehaupt, Karl-Heinrich: *See—*
Kratel, Gunter; Patzke, Jorg; and Wegehaupt, Karl-Heinrich, 3,929,718.
Weigele, Manfred: *See—*
Leimgruber, Willy; and Weigele, Manfred, 3,929,790.
Weigert, Wolfgang: *See—*
Janzon, Karl Heinz; Weigert, Wolfgang; Hein, Hilmar; Mechler, Helmut; and Meyer-Simon, Eugen, 3,929,907.
Weik, Kirby B.: *See—*
Hogan, Gerard T.; and Weik, Kirby B., 3,929,374.
Weiler, Ernest D., to Rohm & Haas Company. 3-Pyridylmethyl N-(4-cyanomethylphenyl)-carbamate and derivatives. 3,929,810, Cl. 260-294.900.
Weiler, Ernest D.: *See—*
Kilbourn, Edward E.; and Weiler, Ernest D., 3,929,808.
Weir, Niall Galbraith, to Glaxo Laboratories Limited. Cephalosporin compounds. 3,929,780, Cl. 260-243.00C.
Weiss, Anton G.: *See—*
Rathgeb, Paul; Vogel, Christian; and Weiss, Anton G., 3,929,816.
Welch, John A.; and Mitchell, Robert W., to General Tire & Rubber Company, The. Method for fabricating impact absorbing safety structure. 3,929,948, Cl. 264-45.500.
Wells, Richard L. Dental floss roll comprising interconnected pieces each having a pick end. 3,930,059, Cl. 427-2.000.
Wendt Laboratories, Inc.: *See—*
Bergt, Gregory P., 3,929,989.
Wenzel, Werner; Speich, Peter; Kurtz, Roman; Gudenau, Heinrich; and Franke, Friedrich, to Rheinische Braunkohlenwerke AG; and Wenzel, Werner. Process for producing agglomerates from fine-grained lignite or fine grained carbonized lignite or from mixtures of the two. 3,929,955, Cl. 264-117.000.
Werges, Darrell L., to Nalco Chemical Company. Tubular catalytic reactor with premixing means for multiple reactants of different densities. 3,929,421, Cl. 23-288.00M.
Wesberg, Alex. Combined heel positioner and arch support for the foot. 3,929,140, Cl. 128-595.000.
West, Donald L.: *See—*
Cialone, David R.; Hieronymus, Gerald W.; Kruspe, Henry R.; McCornack, Richard W.; Perkins, Norwood K.; and West, Donald L., 3,929,071.
West, James Edward: *See—*
Ryan, Francis William; Schonhorn, Harold; Sessler, Gerhard Martin; and West, James Edward, 3,930,066.
Westates Space-Era Products, Inc.: *See—*
Stephens, James B., 3,929,258.
Westcott, Donald E.: *See—*
Harris, Norman E.; Umina, Anthony P.; and Westcott, Donald E., 3,930,032.
Westerheid, Robert J., to General Electric Company. Pipeline thermal insulation. 3,929,166, Cl. 138-149.000.
Western Electric Company, Inc.: *See—*
Boggs, Luther Miles; and Flichman, Howard John, 3,929,006.
Oldis, John Edward; and Venkatesan, Peruvemba Swaminatha, 3,928,995.
Westinghouse Electric Corporation: *See—*
Braytenbah, Andrew S., 3,928,975.
Braytenbah, Andrew S.; Jaegtnes, Karl O.; and Smith, Millard F., 3,928,976.
Braytenbah, Andrew S.; and Jaegtnes, Karl O., 3,928,977.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,970.
Isaacs, Thelma J.; Gottlieb, Milton S.; Feichtner, John D.; and Price, Andrea A., 3,929,976.
Martin, Jack, 3,930,177.
Misencik, John J., 3,930,187.
Osborne, Robert L., 3,928,972.
Richards, Edward L., 3,930,213.

Richards, Edward L.; Paton, Charles R.; and Rooney, Daniel G., 3,930,214.
Rostron, Joseph R.; Brunson, Lawrence A.; and Soles, Otto H., 3,930,134.
Sampson, Ronald N.; and Chottiner, Jacob, 3,930,094.
Westphal, James A.: *See—*
Fort, J. Robert; Westphal, James A.; Dix, C. Hewitt; and Juiles, Donald R., 3,930,145.
Westvaco Corporation: *See—*
Dimitri, Mitchell S.; and Falkehag, Sten I., 3,929,453.
Maughan, William G., 3,929,536.
Wettstein, Albert: *See—*
Kaufmann, Heinz; and Wettstein, Albert, 3,929,769.
Weymann, Henry P.; and Korose, John, to Reichhold Chemicals, Inc. Adhesive compositions containing zinc resinates of disproportionated rosin. 3,929,703, Cl. 260-27.0BB.
Whirlpool Corporation: *See—*
MacFarlane, Thomas R., 3,929,064.
White, Raymond Hadley, and Hill, Fredric Martin, to Reichhold Chemicals, Inc. Limonene/phenol condensation products and hot-melt adhesives containing the same along with ethylene/unsaturated ester copolymers. 3,929,938, Cl. 260-897.00B.
White, Wayne E.: *See—*
Meshri, Dayal T.; White, Wayne E.; and Sowell, Charles L., 3,929,918.
Whitehall Corporation: *See—*
Pavey, George M., Jr., 3,930,254.
Whiteing, Roland G.; and van Mill, Johannes G. Transmission of information. 3,930,224, Cl. 340-58.000.
Whyte, Thomas P. Antenna mount. 3,928,952, Cl. 52-110.000.
Wick, Alexander Eduard: *See—*
Fischli, Albert Eduard; Klaus, Michael Josef; Mayer, Hans Johann; and Wick, Alexander Eduard, 3,929,853.
Wickens, James Charles: *See—*
Fothergill, Graham Alwyn; Osbond, John Mervyn; and Wickens, James Charles, 3,929,836.
Wiechart, John F.: *See—*
DeVincent, Patsy; Falkowski, John A.; and Wiechart, John F., 3,929,356.
DeVincent, Patsy; and Wiechart, John F., 3,929,357.
Wiener, Liviu B. Apparatus for treating cast materials in the molten state. 3,929,185, Cl. 164-338.000.
Wiggins, Leslie Frederick; James, John William; and Gittos, Maurice Ward, to Aspro-Nicholas Limited. Antiparkinsonism compositions and method. 3,930,006, Cl. 424-254.000.
Wiley, Bruce F., to Phillips Petroleum Company. Sonic logging recording apparatus. 3,930,217, Cl. 340-15.5TN.
Wilke, Gunther; and Heimbach, Paul, to Studiengesellschaft Kohle m.b.H. Ring compounds. 3,929,921, Cl. 260-666.00A.
Wilke, Gunther; and Heimbach, Paul, to Studiengesellschaft Kohle m.b.H. Novel large ring compounds. 3,929,922, Cl. 260-666.0PY.
Wilke, Myron Arden: *See—*
Knappe, LaVerne Frank; Sapetta, Lee Philip; Stroebel, Gary John; and Wilke, Myron Arden, 3,929,328.
Wilks, Alan D., to Universal Oil Products Company. Stabilization of metal plating baths. 3,930,072, Cl. 427-306.000.
Wilkus, Edward Vincent: *See—*
MacKenzie, Burton Thornley, Jr.; and Wilkus, Edward Vincent, 3,930,104.
Willemsen, Willem Hendrik. Apparatus for preparing a dough from a powdered material and a liquid. 3,929,319, Cl. 259-6.000.
William F. Shepherd, Inc.: *See—*
Mohan, Manohar, 3,929,257.
Williams, Francis A., to Eastman Kodak Company. Film cartridge. 3,929,304, Cl. 242-194.000.
Williams Gold Refining Company Incorporated: *See—*
Ingersoll, Clyde E., 3,929,474.
Ingersoll, Clyde E., 3,929,475.
Williamson, Richard P., Jr., to Polaroid Corporation. Battery tester and circuit. 3,930,198, Cl. 324-29.500.
Winfield, John D., to ERCO Industries Limited. Production of chlorine dioxide. 3,929,974, Cl. 423-478.000.
Wing, Stephen C.: *See—*
Kirby, Russell B., Jr., and Wing, Stephen C., 3,929,476.
Winget Limited: *See—*
Merton, Harry; and Howlitt, Thomas Michael, 3,929,400.
Winkler, Aniela. Compositions and systems to recover oils from aqueous and solid surfaces. 3,929,631, Cl. 210-36.000.
Winkler, Franz: *See—*
Schabert, Hans-Peter; and Winkler, Franz, 3,929,567.
Winn, Martin; Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Krei, Joyce Ruth, to Sharps Associates. Alkyl substituted cyclopenta benzopyrans. 3,929,835, Cl. 260-345.300.
Winter, James Douglas; and Elder, Mark Alexander, to Northern Electric Company Limited. A-C signal processing circuits for compandors. 3,930,208, Cl. 333-14.000.
Wirstlin, Arthur N.: *See—*
Wittern, Francis A.; and Wirstlin, Arthur N., 3,929,255.
Wirz, Walter, to Reishauer AG. Device for the feed of grinding tools to grinding machines. 3,928,943, Cl. 51-5.00D.
Wisconsin Alumni Research Foundation: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.
Wise, John: *See—*
Schmunk, John D.; Child, James L., Jr.; Shroy, Robert E.; and Wise, John, 3,929,359.
Wise, Raleigh W.: *See—*
Anagnostopoulos, Constantine E.; and Wise, Raleigh W., 3,929,012.
Wittern, Francis A.; and Wirstlin, Arthur N., to Fawn Engineering Corporation. Vending machine divided helix apparatus. 3,929,255, Cl. 221-75.000.
Wojnar, Robert John; Brittain, Russell James; Bernstein, Jack; and Losee, Kathryn Alice, to E. R. Squibb & Sons, Inc. Antiinflammatory agents and their use. 3,930,005, Cl. 424-253.000.
Wolf, Harold G., Jr.; and Hlavacek, Robert A., to Uniroyal, Inc. Blend of thermoplastic polyurethane elastomer, chlorinated polyethylene, and additional polyethylene. 3,929,928, Cl. 260-859.00R.
Wolf, Rainer: *See—*
Mayerhoefer, Horst; Mueller, Wolfgang; Sollberger, Urs; and Wolf, Rainer, 3,929,940.
Wollen, Dennis J. Flower holder. 3,928,936, Cl. 47-41.0SS.
Woltersdorf, Otto W., Jr.: *See—*
Cragoe, Edward J., Jr.; Schultz, Everett M.; and Woltersdorf, Otto W., Jr., 3,929,872.
Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., to W. R. Grace & Co. Use of enzymes bound to polyurethane. 3,929,574, Cl. 195-29.000.
Wood, Ralph E., to Dunwood Development Corporation. Protection system for the metallic fittings of non-metallic hulls of power boats. 3,929,606, Cl. 204-196.000.
Wood, Vernon E., to Minnesota Mining and Manufacturing Company. Dual cross-flow canister. 3,929,418, Cl. 23-288.0FB.
Wood, William P., to Minnesota Mining and Manufacturing Company. Dual cross-flow canister. 3,929,420, Cl. 23-288.0FB.
Woodruff, Richard E., to TransFRESH Corporation. Process of storing or shipping fresh meat in a modified gaseous atmosphere. 3,930,040, Cl. 426-312.000.
Woodward, Alan Francis, to Barking Brassware Company Limited. Fluid mixing valves. 3,929,281, Cl. 236-12.00R.
Wookey, Norman; Jackson, Arthur Frederick; Collins, Michael Clive; and Francis, Brian, to Ranks Hovis McDougall Limited. Sweetening material and method for manufacturing the same. 3,930,048, Cl. 426-548.000.
Wright, Harold A., to ARCO Polymers, Inc. Photodegradable styrene polymer foams containing conjugated keto steroids. 3,929,690, Cl. 260-2.5HB.
Wright, Howard J.; and Harwell, Kenneth E., to Cook Paint and Varnish Company. Polymeric isocyanates and process for making same. 3,929,744, Cl. 260-80.730.
Wright, James D.: *See—*
Edwards, John M.; and Wright, James D., 3,928,939.
Wright, James Robert: *See—*
Danilewicz, John Christopher; Kemp, John Edward Glyn; Snarey, Michael; and Wright, James Robert, 3,930,004.
Wuhrmann, Jean-Jacques: *See—*
van de Rovaart, Paul; and Wuhrmann, Jean-Jacques, 3,930,044.
Wynn, Virgil J. Three axis adjustable disc sander. 3,928,946, Cl. 51-109.000.
Xenon Corporation: *See—*
Panico, C. Richard, 3,930,176.
Xerox Corporation: *See—*
Ernst, Richard J., 3,929,260.
Jones, Lewis O., 3,929,657.
Liebman, Alan J., 3,929,098.
Thettu, Raghulinga R., 3,929,094.
Thettu, Raghulinga R., 3,929,095.
Thettu, Raghulinga R., 3,929,096.
Young, Eugene F., 3,929,477.
Xicon Data Entry Corporation: *See—*
Henrichon, Ernest G., Jr.; and Bloom, Harvey J., 3,930,231.
Yablonski, Michael E.; and Nichparenko, John, to United States of America, Navy. Opthalmodynamometer. 3,929,124, Cl. 128-2.00T.
Yaeda, Yasuyuki; Hayashi, Shigeki; and Kimura, Kazuo, to Japan Synthetic Rubber Company Limited. Pelletized unvulcanized rubbery polymer. 3,930,107, Cl. 428-407.000.
Yagi, Jun: *See—*
Nakamura, Harutoki; and Yagi, Jun, 3,929,671.
Yajima, Yuzuru: *See—*
Mihara, Hiromichi; Yajima, Yuzuru; and Ide, Yadenji, 3,930,106.
Yakubov, Renat Dovletovich: *See—*
Volkova, Leman Mustafa Kyzy; Korolev, Gennady Vladimirovich; Dubovitsky, Fedor Ivanovich; Trostyanskaya, Irina Ivanovna; Rappoport, Leonid Yakovlevich; Petrov, Gennady Nikolaevich; Shestakovsky, Mikhail Fedorovich; Yakubov, Renat Dovletovich; and Maximov, Sergei Mikhailovich, 3,929,731.
Yale, Harry Louis, to E. R. Squibb & Sons, Inc. 6,7,8,9-Tetrahydropyrido(1,2-a)pyrimidin-4-ones. 3,929,787, Cl. 260-251.00A.
Yamada, Eiji; and Nishikuri, Masao, to Sumitomo Chemical Company, Limited. Anthraquinone disperse dyes. 3,929,842, Cl. 260-376.000.
Yamada, Sachiko: *See—*
Ishikawa, Masayuki; Kaneko, Chikara; Suda, Tatsuo; Yamada, Sachiko; Eguchi, Yukuo; Sugimoto, Akiko; and Sasaki, Satoshi, 3,929,770.
Yamada, Toshio: *See—*
Sasame, Takao; Shigeta, Toshihiko; and Yamada, Toshio, 3,929,596.

Yamaguchi, Kanemichi: *See—*
Komatsu, Yoshihiro; Kakuta, Izumi; and Yamaguchi, Kanemichi, 3,930,041.
Yamahara, Takeshi; Deguchi, Takashi; and Nakamura, Shinji, to Sumitomo Chemical Company, Limited. Process for preparation of a palladium complex compound. 3,929,773, Cl. 260-242.000.
Yamamoto, Nobuo: *See—*
Miyakawa, Masami; Yoneyama, Masakazu; and Yamamoto, Nobuo, 3,929,485.
Yamamoto, Takeshi: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Murakami, Masuo; Koda, Akio; Takashima, Mutsuo; Takagi, Etuo; Sakoh, Ichiro; Matsuda, Hideya; and Suzuki, Tsutomu, 3,929,767.
Yamashita, Yoshisada: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.
Yamatake-Honeywell Company, Ltd.: *See—*
Takeuchi, Kazuhiko; and Matsumoto, Ryoichiro, 3,929,016.
Yamauchi, Toshio, to Daiichi Seiyaku Co., Ltd. Production of free-flowing particles of glucose, fructose or the mixture thereof. 3,929,503, Cl. 127-58.000.
Yamauti, Teruo; Oyama, Yoshishige; and Hohsho, Yukio, to Hitachi, Ltd. Means for cleaning exhaust gas in a reciprocating piston type automobile engine. 3,929,115, Cl. 123-148.00R.
Yamazoe, Yoshinori: *See—*
Tanigawa, Shizuhiko; Kikuya, Satoshi; Yamazoe, Yoshinori; and Nakamura, Chihiro, 3,930,270.
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, to Sumitomo Chemical Company, Limited. Process for electrolytically coloring the anodically oxidized coating on aluminum or aluminum base alloys. 3,929,612, Cl. 204-35.00N.
Yanagihara, Hideki: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,929,910.
Yang, Kang: *See—*
Johnson, Morris A.; and Yang, Kang, 3,929,599.
Yashiro, Kunijo: *See—*
Shinomiya, Hiroshi; Muro, Kajuro; Sakata, Sumio; Saida, Shigeki; Umehara, Seichiro; Tsuchiya, Yutaka; Yashiro, Kunijo; and Moriya, Yoshio, 3,930,081.
Yasuda, Kazuo: *See—*
Takano, Nobuyoshi; Sakai, Kaoru; Aoki, Satoshi; and Yasuda, Kazuo, 3,929,411.
Yawata Iron & Steel Co., Ltd.: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.
Yawata Welding Electrode Co., Ltd.: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.
Yingst, Donald Eugene: *See—*
Mosher, Arthur Joseph; and Yingst, Donald Eugene, 3,930,045.
Yokogawa, Kanae: *See—*
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, 3,929,579.
Yokohama Rubber Company, Ltd., The: *See—*
Koyama, Masao; Akashi, Hiromitsu; Nishikawa, Yoichi; Fujiwara, Susumu; and Okada, Takao, 3,930,141.
Yokoi, Kiyoshi: *See—*
Nishi, Takeshi; Kimura, Tsurugi; Moriguchi, Isao; Yokoi, Kiyoshi; Nakakobo, Isojiro; and Kumagai, Ryohei, 3,929,428.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., to United States of America, Agriculture. Process for preparing mixtures of carotenoid pigments. 3,930,037, Cl. 426-268.000.
Yokoyama, Henry; Hsu, Wan-Jean; and Poling, Stephen M., to United States of America, Agriculture. Method for coloring fruits and vegetables. 3,930,038, Cl. 426-269.000.
Yoli, Alfred H.: *See—*
Jones, Cecil R.; Yoli, Alfred H.; and Kirk, William F., 3,929,570.
Yoneyama, Masakazu: *See—*
Miyakawa, Masami; Yoneyama, Masakazu; and Yamamoto, Nobuo, 3,929,485.
Yorihiro, Kazuo: *See—*
Abiko, Shiro; Yorihiro, Kazuo; Sugihara, Toshiyuki; and Hanawa, Masakazu, 3,929,618.
Yoshida, Kazuetsu: *See—*
Kudo, Tetsuichi; Gejyo, Tetsuo; Yoshida, Kazuetsu; and Seki, Michiharu, 3,929,670.
Yoshida, Kyusaku: *See—*
Habu, Teiji; Nakajima, Tomio; Sakamoto, Eiichi; Kadokura, Kenzi; Yoshida, Kyusaku; and Machida, Katsutoshi, 3,929,486.
Yoshida, Toshio: *See—*
Kumasa, Ikuzi; Yamamoto, Takeshi; Norose, Fumitaka; Acutagawa, Susumu; Yoshida, Toshio; and Komatsu, Akira, 3,929,893.
Yoshihara, Yasuhiko: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; and Hirose, Yoshio, 3,929,571.
Yoshihito, Osada: *See—*
Eishun, Tsuchida; and Yoshihito, Osada, 3,929,750.
Yoshimura, Yoshio; Yokogawa, Kanae; and Kawata, Shigeo, to Dainippon Pharmaceutical Co., Ltd. Dental caries-inducing microorganism cells lytic enzyme. 3,929,579, Cl. 195-62.000.
Yotumoto, Keiichi: *See—*
Araki, Kunio; Sasaki, Takashi; Kasahara, Yuko; Yamashita, Yoshisada; Yotumoto, Keiichi; Sunaga, Hiromi; Tabei, Kiyoshi; Goto, Kazuo; Tajiri, Kunio; and Kittaka, Hirokazu, 3,930,098.
Young, Eugene F., to Xerox Corporation. Image producing techniques of superconducting material in a magnetic field. 3,929,477, Cl. 96-1.00R.
Young, R.: *See—*
Tarrson, E. B.; and Young, R., 3,929,144.
Young, Robert R.; Randleman, Patrick L.; and Stolins, Arthur B., to Anatronics Corporation. Fluid transport and metering system. 3,929,413, Cl. 23-259.000.
Youngblood, Douglas J.: *See—*
Nelson, Gerald V.; Youngblood, Douglas J.; and Colvert, James H., 3,929,668.
Youngdale, Gilbert A., to Upjohn Company, The. Composition and method of producing infertility in male rodents. 3,930,012, Cl. 424-278.000.
Younkin, James R., to Edo - Aire Mitchell Industries, Inc. Pressure transducer. 3,929,019, Cl. 73-398.00C.
Zabransky, Robert F., to Universal Oil Products Company. Method of controlling HF alkylation reaction temperature. 3,929,926, Cl. 260-683.480.
Zadra, Mario D.: *See—*
Tazuma, James J.; and Zadra, Mario D., 3,929,737.
Zaffaroni, Alejandro, to Alza Corporation. Intrauterine device and method for releasing pharmaceutically acceptable contraceptive heterogenous compounds. 3,929,984, Cl. 424-22.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Umezawa, Sumio; and Tsuchiya, Osamu, 3,929,762.
Umezawa, Sumio; Umezawa, Hamao; and Tsuchiya, Tsutomu, 3,929,761.
Zakharov, Ivan Dmitrievich: *See—*
Kedrinsky, Vasily Nikolaevich; and Zakharov, Ivan Dmitrievich, 3,928,944.
Zanoni, Gianfranco: *See—*
Buonomo, Franco; Fattore, Vittorio; Zanoni, Gianfranco; and Notari, Bruno, 3,929,681.
Zapf, Donald C., to United States of America, Navy. Mild detonating fuse end termination. 3,929,072, Cl. 102-27.00R.
Zellweger, Ltd.: *See—*
Aeppli, Kurt, 3,930,205.
Zevering, Willem, to Stichting Revalidatie Instituut Muiderpoort. Artificial leg. 3,928,873, Cl. 3-27.000.
Zimon, Heinrich: *See—*
Brinkmann, Dieter; Simon, Wolfgang; and Zimon, Heinrich, 3,929,188.
Zinn, Mortimer H.; Taylor, George W.; and Garoff, Kenton, to United States of America, Army. Device and circuit for detecting a pulse signal in noise in real time. 3,930,204, Cl. 328-229.000.
Zippe, Alfred. Mixture feeder for continuous electric glass-melting furnace. 3,929,445, Cl. 65-335.000.
Zlotin, Boris Nikolaevich; Timofeev, Valentin Vyacheslavovich; and Chernenko, Sergei Vladimirovich. Apparatus for measuring amplitude of vibration of rotating machine parts. 3,929,008, Cl. 73-71.400.
Zocher, Josef, to Singer Company, The. Needles for tufting or the like. 3,929,082, Cl. 112-222.000.
Zoile, Willy Charles Jacques: *See—*
Kobus, Stanislas; Janssens, Juliaan Leo Gerard; and Zoile, Willy Charles Jacques, 3,930,235.
Zumbrunn, Jean-Pierre, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes. Process for conditioning effluent contaminated by aldehyde compounds. 3,929,636, Cl. 210-63.000.
Zumfeld, Heinz; Rutten, Hermann; and Bhattacharya, Nishit, to W. Schlafhorst & Co. Automatic winding machine having a clamping device. 3,929,297, Cl. 242-36.000.

DOCUMENT NUMBER

B 24,017
B 24,018
B 64,868
B 78,331
B 112,422
B 150,560
B 176,995
B 189,772
B 189,773
B 190,679
B 198,810
B 204,161
B 207,272
B 211,786
B 213,211
B 220,683
B 222,188
B 223,621
B 224,323
B 233,383
B 233,741
B 235,011
B 235,925
B 236,609
B 237,953
B 239,289
B 241,433
B 245,194
B 248,916
B 251,109
B 251,635
B 252,947
B 254,211
B 254,708
B 255,756
B 256,334
B 256,936
B 258,687
B 259,236
B 259,274
B 260,455
B 260,945
B 261,378
B 261,828
B 262,241
B 262,287
B 262,378
B 264,257
B 264,833
B 265,369
B 265,727
B 265,862
B 266,195
B 269,673
B 270,089
B 271,104
B 274,945
B 275,426
B 276,271
B 276,560
B 277,449
B 278,491
B 278,991
B 279,583
B 280,015
B 280,395
B 281,341
B 281,943
B 282,081
B 282,252
B 283,124
B 283,300
B 284,297
B 285,200
B 285,796
B 286,499
B 286,614
B 286,913
B 287,164
B 287,270
B 287,275
B 287,373
B 288,018
B 288,627
B 288,638
B 289,175

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975
B 24,018	3,914,206	Oct. 21, 1975
B 64,868	3,914,141	Oct. 21, 1975
B 78,331	3,914,142	Oct. 21, 1975
B 112,422	3,913,484	Oct. 21, 1975
B 150,560	3,913,654	Oct. 21, 1975
B 176,995	3,915,773	Oct. 28, 1975
B 189,772	3,925,367	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975
B 204,161	3,924,605	Dec. 9, 1975
B 207,272	3,914,123	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975
B 220,683	3,914,471	Oct. 21, 1975
B 222,188	3,914,739	Oct. 21, 1975
B 223,621	3,925,526	Dec. 9, 1975
B 224,323	3,925,476	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975
B 233,741	3,925,326	Dec. 9, 1975
B 235,011	3,925,086	Dec. 9, 1975
B 235,925	3,924,949	Dec. 9, 1975
B 236,609	3,925,187	Dec. 9, 1975
B 237,953	3,924,051	Dec. 2, 1975
B 239,289	3,922,711	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975
B 245,194	3,919,179	Nov. 11, 1975
B 248,916	3,920,862	Nov. 18, 1975
B 251,109	3,914,148	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975
B 252,947	3,923,803	Dec. 2, 1975
B 254,211	3,917,677	Nov. 4, 1975
B 254,708	3,923,878	Dec. 2, 1975
B 255,756	3,923,781	Dec. 2, 1975
B 256,334	3,924,988	Dec. 9, 1975
B 256,936	3,925,513	Dec. 9, 1975
B 258,687	3,914,221	Oct. 21, 1975
B 259,236	3,924,874	Dec. 9, 1975
B 259,274	3,928,688	Dec. 23, 1975
B 260,455	3,925,634	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975
B 261,378	3,913,468	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975
B 262,287	3,921,209	Nov. 18, 1975
B 262,378	3,914,410	Oct. 21, 1975
B 264,257	3,928,665	Dec. 23, 1975
B 264,833	3,923,566	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975
B 265,862	3,915,915	Oct. 28, 1975
B 266,195	3,923,599	Dec. 2, 1975
B 269,673	3,914,377	Oct. 21, 1975
B 270,089	3,923,875	Dec. 2, 1975
B 271,104	3,925,400	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975
B 276,560	3,916,030	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975
B 278,991	3,914,469	Oct. 21, 1975
B 279,583	3,923,749	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975
B 280,395	3,919,604	Nov. 11, 1975
B 281,341	3,920,643	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975
B 283,300	3,925,011	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975
B 285,200	3,923,680	Dec. 2, 1975
B 285,796	3,914,303	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975
B 286,614	3,924,696	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975
B 287,164	3,914,139	Oct. 21, 1975
B 287,270	3,924,825	Dec. 9, 1975
B 287,275	3,925,141	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975
B 288,018	3,925,239	Dec. 9, 1975
B 288,627	3,916,179	Oct. 28, 1975
B 288,638	3,925,132	Dec. 9, 1975
B 289,175	3,924,309	Dec. 9, 1975
B 289,471	3,917,184	Nov. 4, 1975
B 289,523	3,921,166	Nov. 18, 1975
B 289,883	3,925,063	Dec. 9, 1975
B 290,328	3,924,838	Dec. 9, 1975
B 291,104	3,925,007	Dec. 9, 1975
B 291,694	3,925,339	Dec. 9, 1975
B 292,054	3,915,877	Oct. 28, 1975
B 292,126	3,914,465	Oct. 21, 1975
B 292,140	3,914,340	Oct. 21, 1975
B 292,300	3,927,167	Dec. 16, 1975
B 292,563	3,923,653	Dec. 2, 1975
B 293,378	3,923,725	Dec. 2, 1975
B 293,437	3,913,414	Oct. 21, 1975
B 294,103	3,924,396	Dec. 9, 1975
B 294,579	3,916,737	Nov. 4, 1975
B 294,673	3,916,023	Oct. 28, 1975
B 295,481	3,921,593	Nov. 25, 1975
B 295,674	3,916,107	Oct. 28, 1975
B 295,860	3,923,880	Dec. 2, 1975
B 299,267	3,917,106	Nov. 4, 1975
B 300,353	3,921,734	Nov. 25, 1975
B 302,271	3,929,130	Dec. 30, 1975
B 302,692	3,924,598	Dec. 9, 1975
B 302,836	3,923,573	Dec. 2, 1975
B 302,998	3,928,233	Dec. 23, 1975
B 303,011	3,930,188	Dec. 30, 1975
B 303,655	3,924,642	Dec. 9, 1975
B 303,702	3,914,131	Oct. 21, 1975
B 304,687	3,924,783	Dec. 9, 1975
B 305,417	3,915,882	Oct. 28, 1975
B 305,868	3,921,463	Nov. 25, 1975
B 305,881	3,923,478	Dec. 2, 1975
B 306,829	3,925,411	Dec. 9, 1975
B 306,938	3,916,050	Oct. 28, 1975
B 307,677	3,915,276	Oct. 28, 1975
B 308,661	3,924,349	Dec. 9, 1975
B 308,892	3,919,624	Nov. 11, 1975
B 309,207	3,914,743	Oct. 21, 1975
B 309,499	3,922,002	Nov. 25, 1975
B 309,681	3,927,374	Dec. 16, 1975
B 309,755	3,919,468	Nov. 11, 1975
B 309,756	3,914,136	Oct. 21, 1975
B 309,860	3,922,485	Nov. 25, 1975
B 310,149	3,924,705	Dec. 9, 1975
B 310,271	3,923,689	Dec. 2, 1975
B 311,313	3,925,142	Dec. 9, 1975
B 311,317	3,918,975	Nov. 11, 1975
B 311,413	3,925,515	Dec. 9, 1975
B 311,910	3,924,357	Dec. 9, 1975
B 311,911	3,925,233	Dec. 9, 1975
B 312,139	3,925,530	Dec. 9, 1975
B 312,477	3,923,714	Dec. 2, 1975
B 313,098	3,925,045	Dec. 9, 1975
B 313,531	3,925,548	Dec. 9, 1975
B 313,594	3,924,626	Dec. 9, 1975
B 313,900	3,915,932	Oct. 28, 1975
B 314,049	3,920,588	Nov. 18, 1975
B 314,255	3,923,764	Dec. 2, 1975
B 314,271	3,921,845	Nov. 25, 1975
B 314,489	3,925,016	Dec. 9, 1975
B 314,800	3,930,087	Dec. 30, 1975
B 314,977	3,923,459	Dec. 2, 1975
B 315,363	3,920,673	Nov. 18, 1975
B 315,397	3,923,963	Dec. 2, 1975
B 315,731	3,914,108	Oct. 21, 1975
B 316,014	3,920,861	Nov. 18, 1975
B 316,239	3,913,546	Oct. 21, 1975
B 316,917	3,925,494	Dec. 9, 1975
B 317,080	3,925,324	Dec. 9, 1975
B 317,347	3,923,552	Dec. 2, 1975
B 317,624	3,925,167	Dec. 9, 1975
B 318,195	3,915,699	Oct. 28, 1975
B 318,618	3,915,365	Oct. 28, 1975
B 318,640	3,925,186	Dec. 9, 1975
B 318,745	3,916,571	Nov. 4, 1975
B 319,226	3,925,082	Dec. 9, 1975
B 319,339	3,916,056	Oct. 28, 1975
B 319,402	3,919,568	Nov. 11, 1975
B 319,414	3,928,666	Dec. 23, 1975
B 320,261	3,924,033	Dec. 2, 1975
B 320,452	3,925,083	Dec. 9, 1975
B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,611	3,920,863	Nov. 18, 1975
B 322,777	3,924,382	Dec. 9, 1975
B 323,127	3,923,967	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975
B 323,666	3,924,568	Dec. 9, 1975
B 324,495	3,928,664	Dec. 23, 1975
B 324,503	3,928,524	Dec. 23, 1975
B 324,505	3,925,294	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975
B 325,102	3,924,355	Dec. 9, 1975
B 325,262	3,921,304	Nov. 25, 1975
B 326,514	3,925,080	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975
B 327,363	3,923,504	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975
B 327,674	3,918,540	Nov. 11, 1975
B 327,899	3,925,674	Dec. 9, 1975
B 328,164	3,914,703	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975
B 328,205	3,914,106	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975
B 329,115	3,924,727	Dec. 9, 1975
B 329,476	3,920,562	Nov. 18, 1975
B 329,612	3,925,128	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975
B 329,816	3,923,947	Dec. 2, 1975
B 330,536	3,925,452	Dec. 9, 1975
B 330,828	3,913,589	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975
B 331,895	3,916,403	Oct. 28, 1975
B 332,527	3,924,017	Dec. 2, 1975
B 332,811	3,924,359	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975
B 333,928	3,927,172	Dec. 16, 1975
B 334,251	3,924,719	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975
B 334,985	3,923,912	Dec. 2, 1975
B 335,670	3,928,686	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975
B 335,773	3,920,953	Nov. 18, 1975
B 336,129	3,923,606	Dec. 2, 1975
B 336,243	3,925,422	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975
B 336,946	3,919,425	Nov. 11, 1975
B 336,978	3,923,968	Dec. 2, 1975
B 337,235	3,919,386	Nov. 11, 1975
B 337,409	3,925,258	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975
B 339,057	3,924,822	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975
B 339,838	3,930,221	Dec. 30, 1975
B 340,212	3,922,645	Nov. 25, 1975
B 340,833	3,925,208	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975
B 342,423	3,925,334	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975
B 343,136	3,919,453	Nov. 11, 1975
B 343,240	3,925,693	Dec. 9, 1975
B 343,506	3,916,021	Oct. 28, 1975
B 343,577	3,921,165	Nov. 18, 1975
B 344,203	3,928,719	Dec. 23, 1975
B 344,479	3,924,042	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975
B 345,384	3,916,146	Oct. 28, 1975
B 345,422	3,914,392	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975
B 346,487	3,927,406	Dec. 16, 1975
B 346,585	3,913,820	Oct. 21, 1975
B 346,613	3,923,545	Dec. 2, 1975
B 346,901	3,915,583	Oct. 28, 1975
B 348,083	3,923,774	Dec. 2, 1975
B 348,383	3,923,452	Dec. 2, 1975
B 348,495	3,914,654	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975
B 349,177	3,914,033	Oct. 21, 1975
B 349,231	3,915,831	Oct. 28, 1975
B 349,321	3,916,103	Oct. 28, 1975
B 349,948	3,914,557	Oct. 21, 1975
B 350,025	3,927,415	Dec. 16, 1975
B 350,143	3,924,41[illegible]	Dec. 9, 1975
B 350,219	3,917,802	Nov. 4, 1975
B 350,245	3,914,331	Oct. 21, 1975
B 350,523	3,924,726	Dec. 9, 1975
B 350,589	3,927,419	Dec. 16, 1975
B 350,708	3,923,871	Dec. 2, 1975
B 350,843	3,915,461	Oct. 28, 1975
B 351,055	3,914,074	Oct. 21, 1975
B 351,218	3,914,186	Oct. 21, 1975
B 351,222	3,921,179	Nov. 18, 1975
B 351,348	3,923,563	Dec. 2, 1975
B 351,421	3,914,733	Oct. 21, 1975
B 351,493	3,914,758	Oct. 21, 1975
B 351,535	3,915,239	Oct. 28, 1975
B 351,665	3,919,701	Nov. 11, 1975
B 351,672	3,914,000	Oct. 21, 1975
B 351,735	3,913,385	Oct. 21, 1975
B 351,863	3,914,700	Oct. 21, 1975
B 351,883	3,924,657	Dec. 9, 1975
B 351,926	3,914,133	Oct. 21, 1975
B 351,939	3,913,480	Oct. 21, 1975
B 352,445	3,928,746	Dec. 23, 1975
B 352,934	3,913,692	Oct. 21, 1975
B 352,950	3,922,590	Nov. 25, 1975
B 352,965	3,921,926	Nov. 25, 1975
B 353,317	3,916,446	Nov. 4, 1975
B 353,387	3,924,404	Dec. 9, 1975
B 353,546	3,913,273	Oct. 21, 1975
B 354,008	3,925,081	Dec. 9, 1975
B 354,098	3,925,547	Dec. 9, 1975
B 354,145	3,927,279	Dec. 16, 1975
B 354,296	3,914,580	Oct. 21, 1975
B 354,510	3,928,658	Dec. 23, 1975
B 354,889	3,913,204	Oct. 21, 1975
B 354,979	3,914,251	Oct. 21, 1975
B 355,095	3,925,656	Dec. 9, 1975
B 355,269	3,914,561	Oct. 21, 1975
B 355,510	3,913,704	Oct. 21, 1975
B 355,595	3,925,649	Dec. 9, 1975
B 355,876	3,925,685	Dec. 9, 1975
B 356,032	3,928,636	Dec. 23, 1975
B 356,253	3,925,025	Dec. 9, 1975
B 356,602	3,927,393	Dec. 16, 1975
B 356,724	3,924,586	Dec. 9, 1975
B 357,039	3,924,406	Dec. 9, 1975
B 357,057	3,913,738	Oct. 21, 1975
B 357,131	3,924,453	Dec. 9, 1975
B 357,402	3,914,180	Oct. 21, 1975
B 357,682	3,924,973	Dec. 9, 1975
B 357,803	3,919,470	Nov. 11, 1975
B 358,174	3,924,958	Dec. 9, 1975
B 358,244	3,913,411	Oct. 21, 1975
B 358,311	3,923,561	Dec. 2, 1975
B 358,939	3,924,713	Dec. 9, 1975
B 359,174	3,914,117	Oct. 21, 1975
B 359,187	3,924,525	Dec. 9, 1975
B 359,540	3,915,235	Oct. 28, 1975
B 359,791	3,929,430	Dec. 30, 1975
B 359,825	3,921,344	Nov. 25, 1975
B 359,946	3,914,132	Oct. 21, 1975
B 359,947	3,914,653	Oct. 21, 1975
B 360,208	3,923,750	Dec. 2, 1975
B 360,296	3,916,720	Nov. 4, 1975
B 360,719	3,915,715	Oct. 28, 1975
B 360,910	3,925,696	Dec. 9, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,443	3,927,405	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 363,962	3,921,826	Nov. 25, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 411,483	3,925,196	Dec. 9, 1975
B 387,761	3,914,245	Oct. 21, 1975	B 411,633	3,914,741	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975	B 412,516	3,927,417	Dec. 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Panzer, Hans peter; and Dixon, Kenneth Wayne, Re. 28,670.

Dixon, Kenneth Wayne: *See*—
Panzer, Hans peter; and Dixon, Kenneth Wayne, Re. 28,670.

Dow Chemical Company, The: *See*—
Tomalia, Donald A.; and Sheetz, David P., Re. 28,669.

Eastman Kodak Company: *See*—
Herz, Arthur H.; and Westcott, Edwin R., Re. 28,668.

Gainesville Machine Company, Inc.: *See*—
Harben, Grover S., Jr., Re. 28,666.

Gores, Kenneth W., to Kirkman Laboratories, Inc. Double tray dental apparatus. Re. 28,667, Cl. 128-136.000.

Harben, Grover S., Jr., to Gainesville Machine Company, Inc. Poultry processing method and apparatus. Re. 28,666, Cl. 17-11.000.

Herz, Arthur H.; and Westcott, Edwin R., to Eastman Kodak Company. Silver halide emulsions containing alkyl selenols and thiols as antifoggants. Re. 28,668, Cl. 96-76.00R.

Kirkman Laboratories, Inc.: *See*—
Gores, Kenneth W., Re. 28,667.

Panzer, Hans peter; and Dixon, Kenneth Wayne, to American Cyanamid Company. Polyquaternary flocculants. Re. 28,670, Cl. 260-2.0BP.

Sheetz, David P.: *See*—
Tomalia, Donald A.; and Sheetz, David P., Re. 28,669.

Tomalia, Donald A.; and Sheetz, David P., to Dow Chemical Company, The. Bi-2-oxazoline and oxazine compounds derived from cyanoethylated poly(ethylene glycols) and poly(propylene glycols). Re. 28,669, Cl. 260-2.00N.

Westcott, Edwin R.: *See*—
Herz, Arthur H.; and Westcott, Edwin R., Re. 28,668.

LIST OF DESIGN PATENTEES

A/S Teknova: *See*—
Hogh, Jorgen, and Bonne. 238,273.

Acushnet Co.: *See*—
Lynch, Francis D., Jepson, and Brown. 238,287.

Addmaster Corp.:. *See*—
Hauser, Stephen G. 238,283.

Alexander, Fred C., to Universal-Rundle Corp. Combined bathtub and shower stall. 238,276, 12–30–75, Cl. D23—49.

Alger, Andrew L., and K. Yamasaki, to Uarco Inc. Burster or similar article. 238,302, 12–30–75, Cl. D55—1.

American Carrier Equipment: *See*—
Sweet, Phillip J., Hamlet, and Sweet. 238,259.

American Trading & Production Corp.: *See*—
Ziskin, Manuel S., and Wagner. 238,238.
Ziskin, Manuel S., and Wagner. 238,241.

Backstrom, Olof F., to Oy Fiskars AB. Scissors. 238,245, 12–30–75, Cl. D8—57.

Baker, James W. Car wash building. 238,270, 12–30–75, Cl. D13—1.

Baker, James W. Car wash building. 238,271, 12–30–75, Cl. D13—1.

Baker, Walter, Jr., to General Electric Co. Housing for window air conditioner. 238,278, 12–30–75, Cl. D23—144.

Balleis, Peter. Toy spinning top. 238,291, 12–30–75, Cl. D34—15.

Barrows, Howard E., and R. J. Berglund, to Tenneco Inc. Cocktail stir stick. 238,239, 12–30–75, Cl. D7—42.

Baumgarten, Carl B., to Gomco Surgical Mfg. Corp. Circumcision clamp. 238,309, 12–30–75, Cl. D83—12.

Beckwith, Edward K. Running sand tooth timer. 238,255, 12–30–75, Cl. D10—44.

Berglund, Richard J.: *See*—
Barrows, Howard E., and Berglund. 238,239.

Bobov, Vitislav Y., D. P. Rybakov, and A. L. Farberg. X-ray apparatus. 238,307, 12–30–75, Cl. D83—1.

Bonne, Adam: *See*—
Hogh, Jorgen, and Bonne. 238,273.

Boutin, Harold S.: *See*—
Spath, William J., and Boutin. 238,226.

Brooks, Richard I., to Kroehler Mfg. Co. Sofa or similar article. 238,223, 12–30–75, Cl. D6—63.

Brown, Robert A.: *See*—
Lynch, Francis D., Jepson, and Brown. 238,287.

Butler, John O., Co.: *See*—
Tarrson, E. B. 238,280.

CBS Inc.: *See*—
Meshulam, Avram. 238,252.
Thomas, John F., III. 238,247.

CITC Industries: *See*—
Cohen, William J. 238,216.

Cali, John S. Dental examination mirror. 238,281, 12–30–75, Cl. D24—1.

Camp Scandinavia AB: *See*—
Elgebrandt, Carl H. 238,235.

Century Mold, Inc.: *See*—
McClain, Myron M. 238,232.

Clark Equipment Co.: *See*—
Linci, Dennis M. 238,260.

Cohen, William J., to CITC Industries. Sport Shoe. 238,216, 12–30–75, Cl. D2—310.

Cohn, Lyle J., to International Seaway Trading Corp. Boot sole. 238,218, 12–30–75, Cl. D2—319.

Cohn, Lyle J., to International Seaway Trading Corp. Boot sole. 238,219, 12–30–75, Cl. D2—319.

Constance Radice: *See*—
Montalbano, Anthony P. 238,301.

Cox, Paul L. Exercise shoe sole. 238,217, 12–30–75, Cl. D2—319.

Daenen, Robert: *See*—
Herlow, Erik, and Daenen. 238,237.

Dalton, Byrd E. Motorcycle saddle bag or similar article. 238,266, 12–30–75, Cl. D12—158.

Dart Industries Inc.: *See*—
Herlow, Erik, and Daenen. 238,237.
Montesi, Edward N. 238,236.

Dobbs, Justin V. Game board. 238,290, 12–30–75, Cl. D34—5.

Durante, Alfred J. Necklace. 238,292, 12–30–75, Cl. D45—16.

Durante, Alfred J. Bracelet. 238,293, 12–30–75, Cl. D45—4.

Durante, Alfred J. Bracelet. 238,294, 12–30–75, Cl. D45—4.

Duris, Rudolph M., to General Signal Corp. Audible vehicle back-up alarm. 238,258, 12–30–75, Cl. D10—116.

Dutchburn, Leslie G. Rotisserie frame. 238,240, 12–30–75, Cl. D7—129.

Dymo Industries, Inc.: *See*—
Spurway, Elliot W. J., Jr. 238,306.

Eberle, Gunter F., to The Vecta Group, Inc. Multiple seating unit or similar article. 238,222, 12–30–75, Cl. D6—59.

Elgebrandt, Carl H., to Camp Scandinavia AB. Seat cushion for a wheelchair. 238,235, 12–30–75, Cl. D6—201.

Elias, Johnny C., and M. C. Hanz. End standard for a gun rack. 238,228, 12–30–75, Cl. D6—114.

Erickson, Gerald. Bottle carrier. 238,249, 12–30–75, Cl. D9—178.

Farberg, Avrum L.: *See*—
Bobov, Vitislav Y., Rybakov, and Farberg. 238,307.

Finley, Arthur L., to The Goodyear Tire & Rubber Co. Tire. 238,263, 12–30–75, Cl. D12—143.

Folden, Clarence L., to Sears, Roebuck & Co. Combined bathtub and shower stall. 238,275, 12–30–75, Cl. D23—49.

Food Warming Equipment Co., Inc.: *See*—
Klemm, Richard O. 238,299.
Klemm, Richard O. 238,300.

Franzen, Ingemar, and S. O. Wikholm. Pool cleaner. 238,297, 12–30–75, Cl. D49—11.

French, Jerome J. Dental floss holder. 238,279, 12–30–75, Cl. D24—1.

Garey, Iraida, to D. Lisner & Co., Inc. Jewelry display support or similar article. 238,251, 12–30–75, Cl. D9—191.

General Electric Co.: *See*—
Baker, Walter, Jr. 238,278.

General Signal Corp.: *See*—
Duris, Rudolph M. 238,258.

Gentry, Corbin, Inc.: *See*—
Hanagan, Michael W. 238,220.
Hanagan, Michael W. 238,221.

Gomco Surgical Mfg. Corp.: *See*—
Baumgarten, Carl B. 238,309.

Goodyear Tire & Rubber Co., The: *See*—
Finley, Arthur L. 238,263.

Grace, W. R., & Co.: *See*—
Sauer, William J., Sr. 238,250.

Grant, Foster, Co.: *See*—
Leblanc, Conrad. 238,303.

Greene, Jayne H.: *See*—
Kingsford, Ted L., and Greene. 238,311.

Hamlet, Buck C. *See*—
Sweet, Phillip J., Hamlet, and Sweet. 238,259.

Hanagan, Michael W., to Corbin Gentry, Inc. Motorcycle seat. 238,220, 12–30–75, Cl. D6—48.

Hanagan, Michael W., to Corbin Gentry, Inc. Motorcycle seat. 238,221, 12–30–75, Cl. D6—48.

Haney, Ralph D.: *See*—
Shawen, Harley J., Haney, and Kohli. 238,282.

Hanz, Marvin C.: *See*—
Elkins, Johnny C., and Hanz. 238,228.

Hauser, Stephen G., to Addmaster Corp. Calculator. 238,283, 12–30–75, Cl. D26—5.

Hengst, Alfred, H. Janke, and E. Ruehl, to Ernst Leitz GmbH. Binocular. 238,304, 12–30–75, Cl. D57—1.

Herlow, Erik, and R. Daenen, to Dart Industries, Inc. Combined storage bowl and serving plate. 238,237, 12–30–75, Cl. D7—17.
Hogh, Jorgen, and A. Bonne, to A/S Teknova. Casing for a fluid conduit component. 238,273, 12–30–75, Cl. D23—19.
Inoue Rubber Co., Ltd. : *See*—
Ogiso, Teruo. 238,262.
Ogiso, Teruo. 238,264.
International Seaway Trading Corp. : *See*—
Cohn, Lyle J. 238,218.
Cohn, Lyle J. 238,219.
Janke, Heinrich : *See*—
Hengst, Alfred, Janke, and Ruehl. 238,304.
Jepson, John W. : *See*—
Lynch, Francis D., Jepson, and Brown. 238,287.
Kalmar Trading Co. : *See*—
Wright, Robert K. 238,313.
Kelley Co., Inc. : *See*—
Maki, Richard G., Riemer, and Potter. 238,261.
Kingsford, Ted L., to Plough, Inc. Combined compact and makeup mirror. 238,310, 12–30–75, Cl. D86—10.
Kingsford, Ted L., and J. H. Greene, to Plough, Inc. Combined lipstick and casing therefor. 238,311, 12–30–75, Cl. D86—10.
Klenm, Richard O., to Food Warming Equipment Co., Inc. Heated cabinet. 238,299, 12–30–75, Cl. D55—1.
Klenm, Richard O., to Food Warming Equipment Co., Inc. Banquet cabinet. 238,300, 12–30–75, Cl. D55—1.
Kohli, Jerry L. : *See*—
Shawen, Harley J., Haney, and Kohli. 238,282.
Kotzenberg, William E. : *See*—
Touchett, Terrance N., and Kotzenberg. 238,229.
Kroehler Mfg. Co. : *See*—
Brooks, Richard I. 238,223.
Larson, Clayton E. Ladder. 238,298, 12–30–75, Cl. D54—1.
Leblanc, Conrad, to Foster Grant Co., Inc. Pair of spectacles. 238,303, 12–30–75, Cl. D57—1.
Lentz, Ernst, Gmbli : *See*—
Hengst, Alfred, Janke, and Ruehl. 238,304.
Linel, Dennis M., to Clark Equipment Co. Lift truck body. 238,260, 12–30–75, Cl. D12—61.
Lisner, D., & Co., Inc. : *See*—
Garey, Iraida. 238,251.
Lynch, Francis D., J. W. Jepson, and R. A. Brown, to Acushnet Co. Golf ball. 238,287, 12–30–75, Cl. D34—5.
Lyons, Christine R. Clothing rack. 238,225, 12–30–75, Cl. D6—85.
Maki, Richard G., R. E. Riemer, and R. B. Potter, to Kelley Co., Inc. Support leg for a dockboard. 238,261, 12–30–75, Cl. D12—60.
Mathonen, Pentti K. Console for fault detector for paper webs. 238,256, 12–30–75, Cl. D10—46.
McClain, Myron M., to Century Mold, Inc. Leg for article of furniture. 238,232, 12–30–75, Cl. D6—195.
McClain, Myron M., to Miami Valley Plastic. Leg for article of furniture. 238,231, 12–30–75, Cl. D6—195.
McGraw-Edison Co. : *See*—
Touchett, Terrance N., and Kotzenberg. 238,229.
Meshulam, Avram, to CBS Inc. Blade dispensing package. 238,252, 12–30–75, Cl. D9—193.
Miami Valley Plastic : *See*—
McClain, Myron M. 238,231.
Miller, Richard A., to Rusco Industries, Inc. Bed frame leg. 238,234, 12–30–75, Cl. D6—198.
Montalbano, Anthony P., to Constance Radice. Compactor. 238,301, 12–30–75, Cl. D55—1.
Montesi, Edward N., to Dart Industries Inc. Combined serving bowl and closure. 238,236, 12–30–75, Cl. D7—17.
Ochi, Masaomi, to Ochi Trading Co., Ltd. Roller skate. 238,286, 12–30–75, Cl. D34—14.
Ochi Trading Co., Ltd. : *See*—
Ochi, Masaomi. 238,286.
Ochial, Jiro : *See*—
Suzuki, Tomokazu, and Ochial. 238,253.
Ogiso, Teruo, to Inoue Rubber Co., Ltd. Tire. 238,262, 12–30–75, Cl. D12—136.
Ogiso, Teruo, to Inoue Rubber Co., Ltd. Tire. 238,264, 12–30–75, Cl. D12—145.
Owatonna Tool Co. : *See*—
Polivka, John N. 238,243.
Oy Fiskars Ab : *See*—
Backstrom, Olof F. 238,245.
Pasquale, Michael J. Bottle opener or similar article. 238,244, 12–30–75, Cl. D8—18.
Plough, Inc. : *See*—
Kingsford, Ted L. 238,310.
Kingsford, Ted L., and Greene. 238,311.
Polivka, John N., to Owatoona Tool Co. Fluid powered dispensing gun or similar article for viscous material. 238,243, 12–30–75, Cl. D8—14.
Potter, Roderick B. : *See*—
Maki, Richard G., Riemer, and Potter. 238,261.
Reenskaug, Frank, to West Norway Factories Ltd. A/S. Chair. 238,224, 12–30–75, Cl. D6—73.
Regensburg, Charles P. Combined electrically lighted dice and backgammon board. 238,289, 12–30–75, Cl. D34—5.
Rickard, Robert E. Article holder. 238,246, 12–30–75, Cl. D8—71.
Riemer, Ronald E. : *See*—
Maki, Richard G., Riemer, and Potter. 238,261.
Rios, Richard. Rotary reflector. 238,257, 12–30–75, Cl. D10—111.
Ross, Barney F. Golf club head. 238,285, 12–30–75, Cl. D34—5.
Ruehl, Ernst : *See*—
Hengst, Alfred, Janke, and Ruehl. 238,304.
Rusco Industries, Inc. : *See*—
Miller, Richard A. 238,234.
Rybakov, Dmitry P. : *See*—
Bobov, Vitaliay Y., Rybakov, and Farberg. 238,307.
Sauer, William J., Sr., to W. R. Grace & Co. Combined confectionery tray and mold. 238,250, 12–30–75, Cl. D9—187.
Schohn, Wilhelmina. Parlor game board and accessories for use therewith. 238,288, 12–30–75, Cl. D34—5.
Schwartzman, Gilbert. Cleaning fluid applicator. 238,242, 12–30–75, Cl. D7—178.
Sears, Roebuck & Co. : *See*—
Folden, Clarence L. 238,275.
Shawen, Harley J., R. D. Haney, and J. L. Kohli. Financial proof machine. 238,282, 12–30–75, Cl. D26—5.
Shell, Irving W. Support member for use with signs shelves, partitions and the like. 238,272, 12–30–75, Cl. D13—6.
Sherin, Michael H. Specimen collector. 238,308, 12–30–75, Cl. D83—1.
Sklaroff, William B., to Tiffany Industries, Inc. Desk. 238,230, 12–30–75 Cl. D6—158.
Slagel, Roger D. Valve base. 238,274, 12–30–75, Cl. D23—19.
Smith, Robert L. Multi-service module for a mobile camper park. 238,314, 12–30–75, Cl. D26—12.
Spath, William J., and H. S. Boutin ; said H. S. Boutin assignor to W. J. Spath. Shower rack. 238,226, 12–30–75, Cl. D6—91.
Spurway, Elliot W. J., Jr., to Dymo Industries, Inc. Portable transaction log recorder. 238,306, 12–30–75, Cl. D64—11.
Stewart, Edward. Boat hull cover. 238,265, 12–30–75, Cl. D12—150.
Strada, Charles. Motorcycle exhaust pipe. 238,267, 12–30–75, Cl. D12—194.
Strada, Charles. Motorcycle exhaust pipe. 238,268, 12–30–75, Cl. D12—194.
Stromberg Datagraphix, Inc. : *See*—
Vedder, Gene D. 238,305.
Sulek, Eugene J., to Texas Instruments Inc. Watch casing. 238,254, 12–30–75, Cl. D10—38.
Suzuki, Tomokazu, and J. Ochial, to Tamura Electric Works, Ltd. Digital clock. 238,253, 12–30–75, Cl. D10—15.
Sweet, David L. : *See*—
Sweet, Phillip J., Hamlet, and Sweet. 238,259.
Sweet, Phillip J., B. C. Hamlet, and D. L. Sweet, to American Carrier Equipment. Refuse trailer. 238,259, 12–30–75, Cl. D12—15.
Takimoto, Yoshiaki. Front door. 238,269, 12–30–75, Cl. D13—1.
Tamura Electric Works, Ltd. : *See*—
Suzuki, Tomokazu, and Ochial. 238,253.
Tarrson, E. B., to John O. Butler Co. Mouth and dental mirror. 238,280, 12–30–75, Cl. D24—1.
Tenneco Inc. : *See*—
Barrows, Howard E., and Berglund. 238,239.
Texas Instruments Inc. : *See*—
Sulek, Eugene J. 238,254.
Thomas, John F., III, to CBS Inc. Retractable knife. 238,247, 12–30–75, Cl. D8—99.
Tiffany Industries, Inc. : *See*—
Sklaroff, William B. 238,230.
Toedter, William C. Combined basketball goal and bracket. 238,284, 12–30–75, Cl. D34—5.
Tongson, Kenneth Y. Lamp shade. 238,295, 12–30–75, Cl. D48—16.
Touchett, Terrance N., and W. E. Kotzenberg, to McGraw-Edison Co. Pegboard mounted support for displaying power tools. 238,229, 12–30–75, Cl. D6—136.
Trimarchi, Camili. Industrial light fixture. 238,296, 12–30–75, Cl. D48—20.
Turco Inc. : *See*—
Alger, Andrew L., and Yamasaki. 238,302.
Universal-Rundle Corp. : *See*—
Alexander, Fred C. 238,276.
Vecta Group, Inc., The : *See*—
Eberle, Gunter F. 238,222.
Vedder, Gene D., to Stromberg Datagraphix, Inc. Computer output microfilmer. 238,305, 12–30–75, Cl. D61—1.
Wagner, Harold O. : *See*—
Ziskin, Manuel S., and Wagner. 238,238.
Ziskin, Manuel S., and Wagner. 238,241.
Welton, Gerry D. Pillowed sling chair body. 238,233, 12–30–75, Cl. D6—197.
West Norway Factories Ltd. A/S : *See*—
Reenskaug, Frank. 238,224.
Westrich, James L., Jr. Bottle or the like. 238,248, 12–30–75, Cl. D9—65.
Wikholm, Sven O. : *See*—
Petersen, Ingemar, and Wikholm. 238,297.
Witkoff, Robert S. Jewelry box or similar article. 238,312, 12–30–75, Cl. D87—1.
Wright, Robert K., to Kalmar Trading Co. Tent. 238,313, 12–30–75, Cl. D88—3.
Yamasaki, Kim. : *See*—
Alger, Andrew L., and Yamasaki. 238,302.
Zaltlin, Arthur. Artificial fireplace. 238,277, 12–30–75, Cl. D23—94.
Ziskin, Manuel S., and H. O. Wagner, to American Trading & Production Corp. Handle for a hostess tray or the like. 238,238, 12–30–75, Cl. D7—39.
Ziskin, Manuel S., and H. O. Wagner, to American Trading & Production Corp. Handle for a casserole or the like. 238,241, 12–30–75, Cl. D7—132.

CLASS 2
22 3,9
161R 3,9
CLASS 3
27 3,9
CLASS 4
1 3,9
110 3,9
CLASS 5
284 3,9
CLASS 7
1G 3,9
5.5 3,9
CLASS 8
10.1 3,9
3,9
39 3,9
3,9
164 3,9
168 3,9
169 3,9
CLASS 9
400 3,9
CLASS 12
8.2 3,9
142R 3,9
CLASS 14
72 3,9
CLASS 15
4 3,9
21D 3,9
104.3SN 3,9
144A 3,9
250.32 3,9
CLASS 16
35R 3,9
74 3,9
87.2 3,9
CLASS 17
11 Re.28
32 3,9
CLASS 19
200 3,9
CLASS 21
91 3,9
CLASS 23
230R 3,9
258.5 3,9
259 3,9
3,9
3,9
260 3,9
262 3,9
288FB 3,9
3,9
3,9
288M 3,9
288R 3,9
305 3,9
CLASS 24
30.5 3,9
73VA 3,9
196 3,9
224 3,9
243K 3,9
259FS 3,9
CLASS 28
19 3,9
CLASS 29
105R 3,9
156.8B 3,9
180 3,9
182.1 3,9
191 3,9
195 3,9
3,9
196.1 3,9
221.5 3,9
407 3,9
436 3,9
446 3,9
460 3,9
527.4 3,9
603 3,9

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 30, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
22 3,928,872
161R 3,928,871

CLASS 3
27 3,928,873

CLASS 4
1 3,928,874
110 3,928,875

CLASS 5
284 3,928,876

CLASS 7
1G 3,928,877
5.5 3,928,878

CLASS 8
10.1 3,929,403
3,929,404
39 3,929,401
3,929,405
164 3,929,406
168 3,929,407
169 3,929,408

CLASS 9
400 3,928,879

CLASS 12
8.2 3,928,880
142R 3,928,881

CLASS 14
72 3,928,882

CLASS 15
4 3,928,883
21D 3,928,884
104.3SN 3,928,885
144A 3,928,886
250.32 3,928,887

CLASS 16
35R 3,928,888
74 3,928,889
87.2 3,928,890

CLASS 17
11 Re.28,666
32 3,928,891

CLASS 19
200 3,928,892

CLASS 21
91 3,929,409

CLASS 23
230R 3,929,410
258.5 3,929,414
259 3,929,411
3,929,412
3,929,413
260 3,929,416
262 3,929,417
288FB 3,929,418
3,929,419
3,929,420
288M 3,929,421
288R 3,929,422
305 3,929,415

CLASS 24
30.5 3,928,893
73VA 3,928,894
196 3,928,895
224 3,928,896
243K 3,928,897
259FS 3,928,898

CLASS 28
19 3,928,899

CLASS 29
105R 3,928,900
156.8B 3,928,901
180 3,929,423
182.1 3,929,424
191 3,929,425
195 3,929,426
3,929,427
196.1 3,929,428
221.5 3,928,902
407 3,928,903
436 3,928,904
446 3,928,905
460 3,928,906
527.4 3,928,907
603 3,928,908
611 3,928,909
628 3,928,910

CLASS 30
276 3,928,911

CLASS 32
5 3,928,912
8 3,928,913
10A 3,928,914
15 3,928,915
69 3,928,916

CLASS 33
76R 3,928,917
172R 3,928,918
180R 3,928,919

CLASS 34
115 3,928,920

CLASS 35
7A 3,928,921
9R 3,928,922
31R 3,928,923
37 3,928,924
3,929,462
40 3,928,925
76 3,928,926

CLASS 36
11.5 3,928,927

CLASS 40
28.1 3,928,928
125K 3,928,929
145R 3,928,930
152.1 3,928,931

CLASS 46
118 3,928,932
119 3,928,933
3,928,934
180 3,928,935

CLASS 47
41SS 3,928,936

CLASS 48
201 3,929,429
211 3,929,430
214 3,929,431

CLASS 49
403 3,928,937

CLASS 51
5D 3,928,943
33W 3,928,944
80A 3,928,945
109 3,928,946
170T 3,928,947
295 3,929,432
379 3,928,948
401 3,928,949

CLASS 52
92 3,928,951
110 3,928,952
172 3,928,953
473 3,928,954
726 3,928,950

CLASS 53
22B 3,928,938
32 3,928,939
112B 3,928,940
.82 3,928,941
247 3,928,942

CLASS 55
3 3,929,433
68 3,929,434
94 3,929,435
121 3,929,436
367 3,929,437

CLASS 56
1 3,928,955
202 3,928,956

CLASS 57
18 3,928,957
157TS 3,928,958

CLASS 58
23R 3,928,959
152R 3,928,960

CLASS 60
39.02 3,928,961
39.28R 3,928,962
39.66 3,928,963
219 3,928,964
255 3,928,965
278 3,928,966
398 3,928,967
403 3,928,968
428 3,928,969
562 3,928,970
614 3,928,971
646 3,928,972
648 3,928,973
650 3,928,974
660 3,928,975
3,928,976
3,928,977

CLASS 61
3 3,928,978
11 3,928,979
29 3,928,980
45D 3,928,981
50 3,928,982

CLASS 62
9 3,929,438
101 3,928,983
196 3,928,984

CLASS 64
21 3,928,985

CLASS 65
22 3,929,439
32 3,929,440
106 3,929,441
114 3,929,442
117 3,929,443
182R 3,929,444
335 3,929,445

CLASS 66
9B 3,928,986
132R 3,928,987
138 3,928,988
177 3,928,989

CLASS 70
58 3,928,990
364A 3,928,991
366 3,928,992
419 3,928,993

CLASS 71
23 3,929,446
68 3,929,447
3,929,448
82 3,929,449
86 3,929,450
92 3,929,451
100 3,929,452
101 3,929,453
103 3,929,454
115 3,929,455

CLASS 72
8 3,928,994
60 3,928,995
129 3,928,996
178 3,928,997
185 3,928,998
202 3,928,999
402 3,929,000

CLASS 73
7 3,929,001
37.7 3,929,002
61R 3,929,003
61.1C 3,929,004
67.8S 3,929,006
3,929,007
67.8 3,929,005
71.4 3,929,008
136A 3,929,009
141R 3,929,010
155 3,929,011
156 3,929,012
160 3,929,013
168 3,929,014
170A 3,929,015
194EM 3,929,016
198 3,929,017
343R 3,929,018
356 3,929,021
398C 3,929,019
420 3,929,020
431 3,929,022

CLASS 74
10.85 3,929,023
104 3,929,024
217B 3,929,025
237 3,929,026
242.15R 3,929,027
448 3,929,028
473R 3,929,029
492 3,929,030
501R 3,929,031
3,929,032
512 3,929,033
575 3,929,034
616 3,929,035
711 3,929,036
759 3,929,037
810 3,929,038
878 3,929,039

CLASS 75
10R 3,929,456
3,929,457
12 3,929,458
3,929,459
24 3,929,460
30 3,929,461
37 3,929,463
58 3,929,464
65R 3,929,465
83 3,929,466
93G 3,929,467
103 3,929,468
108 3,929,469
122 3,929,470
123J 3,929,471
124 3,929,472
128W 3,929,473
172G 3,929,474
173R 3,929,475
214 3,929,476

CLASS 76
37 3,929,040

CLASS 81
9.51 3,929,041
121R 3,929,042

CLASS 82
1C 3,929,043
46A 3,929,044

CLASS 83
323 3,929,045
409 3,929,046
499 3,929,047
751 3,929,048
834 3,929,049
848 3,929,050

CLASS 84
1.17 3,929,051
1.22 3,929,052
1.24 3,929,053

CLASS 85
61 3,929,054

CLASS 89
1M 3,929,055

CLASS 91
461 3,929,056

CLASS 92
9 3,929,057
13 3,929,058

CLASS 93
58.3 3,929,059

CLASS 96
1R 3,929,477
1.5 3,929,478
1.7 3,929,479
1.8 3,929,480
291. 3,929,481
38.4 3,929,483
55 3,929,484
66R 3,929,485
76R Re.28,668
3,929,486
84R 3,929,487
91R 3,929,488
114 3,929,482
115P 3,929,490
115R 3,929,489

CLASS 100
3 3,929,062
26 3,929,063
53 3,929,064
90 3,929,065
100 3,929,060
116 3,929,061

CLASS 101
35 3,929,066
93.3 3,929,067
128.2 3,929,068
232 3,929,069
298 3,929,070
335 3,929,071
395 3,929,073

CLASS 102
27R 3,929,072
43P 3,929,074
70.2P 3,929,075

CLASS 104
25 3,929,076
93 3,929,077
111 3,929,078
172B 3,929,079

CLASS 106
1 3,929,491
3 3,929,492
35 3,929,493
40R 3,929,494
46 3,929,496
47Q 3,929,495
50 3,929,497
57 3,929,498
268 3,929,499
298 3,929,500
300 3,929,501
3,929,502

CLASS 111
1 3,929,080

CLASS 112
158D 3,929,081
222 3,929,082

CLASS 114
40 3,929,083
66.5H 3,929,084
123 3,929,085
144R 3,929,086
206R 3,929,087

CLASS 115
14 3,929,088
41HT 3,929,089

CLASS 116
34R 3,929,090
124B 3,929,091
124M 3,929,092
124.2R 3,929,093

CLASS 118
60 3,929,094
3,929,095
3,929,096
62 3,929,097
637 3,929,098
3,929,099

CLASS 119
2 3,929,100
5 3,929,101
3,929,102
14.08 3,929,103
82 3,929,104

CLASS 123
8.09 3,929,105
8.11 3,929,106
8.47 3,929,402
32EA 3,929,108
32B 3,929,107
32R 3,929,109
73AD 3,929,110
73R 3,929,111
139BC 3,929,112
139R 3,929,113
3,929,114
148R 3,929,115
182 3,929,116
196R 3,929,117
198A 3,929,118

CLASS 124
1 3,929,519
35A 3,929,120

CLASS 126
271 3,929,121
3,929,122

CLASS 127
58 3,929,503

CLASS 128
2B 3,929,123
2T 3,929,124
2.05C 3,929,129
2.06A 3,929,125
136 Re.28,667
142 3,929,127
194 3,929,128
214R 3,929,130
240 3,929,126
254 3,929,131
260 3,929,132
277 3,929,133
284 3,929,134
287 3,929,135
303.1 3,929,136
303.14 3,929,137
304 3,929,138
583 3,929,139
595 3,929,140

CLASS 131
17R 3,929,141

CLASS 132
9 3,929,142
36.1R 3,929,143
93 3,929,144

CLASS 135
1R 3,929,145
2 3,929,146
7.1A 3,929,147

CLASS 136
6LN 3,929,504
34 3,929,505
86A 3,929,506
114 3,929,507
3,929,508
146 3,929,509
206 3,929,510
228 3,929,511

CLASS 137
84 3,929,148
216 3,929,149
218 3,929,150
268 3,929,151
296 3,929,152
337 3,929,153
344 3,929,154
430 3,929,155
444 3,929,156
453 3,929,157
493.9 3,929,158
596.18 3,929,159
625.5 3,929,160
625.69 3,929,161
627.5 3,929,162

CLASS 138
30 3,929,163
120 3,929,164
121 3,929,165
149 3,929,166
151 3,929,167

CLASS 139
99 3,929,168
122H 3,929,169
124A 3,929,170
336 3,929,171

CLASS 140
93.2 3,929,172

CLASS 141
74 3,929,173
329 3,929,174
392 3,929,175

CLASS 144
32 3,929,176

CLASS 148
1.5 3,929,512
3 3,929,513

6.14 3,929,514
6.2 3,929,521
9R 3,929,515
11.5R 3,929,516
12F 3,929,517
31 3,929,518
31.57 3,929,519
37 3,929,520
112 3,929,522
143 3,929,523
150 3,929,524
171 3,929,525
175 3,929,526
3,929,527
3,929,528
191 3,929,529

CLASS 149

84 3,929,530

CLASS 150

35 3,929,177
52K 3,929,178

CLASS 152

330A 3,929,179
359 3,929,180

CLASS 156

3 3,929,531
11 3,929,532
71 3,929,533
73.5 3,929,534
82 3,929,535
85 3,929,536
86 3,929,537
3,929,538
123 3,929,539
3,929,540
157 3,929,541
167 3,929,542
169 3,929,543
189 3,929,544
220 3,929,545
245 3,929,548
3,929,549
306 3,929,550
345 3,929,551
391 3,929,552
3,929,553
417 3,929,546
425 3,929,554
443 3,929,547
584 3,929,555
611 3,929,556
617 3,929,557

CLASS 162

28 3,929,558
70 3,929,559
157R 3,929,560
161 3,929,561
3,929,562
3,929,563
224 3,929,564

CLASS 164

58 3,929,181
114 3,929,182
123 3,929,183
309 3,929,184
338 3,929,185

CLASS 165

49 3,929,186
52 3,929,187
66 3,929,188
69 3,929,189

CLASS 166

274 3,929,190
276 3,929,191
300 3,929,192
303 3,929,193

CLASS 168

23 3,929,194

CLASS 173

109 3,929,195

CLASS 174

6 3,930,111
25C 3,930,112
40R 3,930,113
52FP 3,930,114
3,930,115
66 3,930,116

CLASS 175

18 3,929,196

CLASS 176

35 3,929,565
37 3,929,566
38 3,929,567
3,929,568
78 3,929,569
80 3,929,570

CLASS 178

6.6R 3,930,117
6.7R 3,930,118
7.6 3,930,119
7.7 3,930,120
66R 3,930,121
69.5TV 3,930,122

CLASS 179

1R 3,930,123
15AQ 3,930,125
15AT 3,930,124
19 3,930,126
84VF 3,930,127
111R 3,930,128
115.5R 3,930,129
181R 3,930,130

CLASS 180

2 3,929,197
9.2C 3,929,204
14A 3,929,198
14R 3,929,199
49 3,929,200
68R 3,929,201
3,929,202
82C 3,929,203
3,929,205

CLASS 181

114 3,929,206
198 3,929,207

CLASS 182

108 3,929,208

CLASS 188

24 3,929,209

CLASS 191

12.2R 3,929,210

CLASS 192

54 3,929,211

CLASS 194

1L 3,929,212
100A 3,929,213

CLASS 195

29 3,929,571
3,929,572
3,929,573
3,929,574
30 3,929,575
3,929,576
36R 3,929,577
49 3,929,578
62 3,929,579
99 3,929,580
103.5R 3,929,581
107 3,929,582
127 3,929,583
3,929,584

CLASS 197

1R 3,929,214
3,929,215
100 3,929,216

CLASS 198

23 3,929,217
37 3,929,218
111 3,929,219
164 3,929,220
220BA 3,929,221

CLASS 200

35R 3,930,131
38R 3,930,132
47 3,930,133
82B 3,930,134
308 3,930,135

CLASS 201

2.5 3,929,585

CLASS 203

37 3,929,586

CLASS 204

1T 3,929,587
3,929,588
3,929,609
13 3,929,610
14N 3,929,611
15 3,929,589
16 3,929,590
17 3,929,591
26 3,929,592
35N 3,929,593
3,929,612
42 3,929,594
44 3,929,595
49 3,929,596
66 3,929,597
77 3,929,613
108 3,929,598
3,929,599
149 3,929,600
157.1R 3,929,601
159.22 3,929,602
192 3,929,604
195P 3,929,603
3,929,605
196 3,929,606
242 3,929,614
258 3,930,151
286 3,929,607
290F 3,929,608

CLASS 206

45.14 3,929,222
234 3,929,223
287 3,929,224
335 3,929,225
410 3,929,226
446 3,929,227

CLASS 208

11 3,929,615
87 3,929,616
96 3,929,617
111 3,929,618
3,929,619
3,929,620
120 3,929,621
3,929,622
135 3,929,623
139 3,929,624
188 3,929,625
309 3,929,626

CLASS 209

9 3,929,627
36 3,929,628
167 3,929,629
395 3,929,647

CLASS 210

17 3,929,630
36 3,929,631
43 3,929,632
49 3,929,633
3,929,634
54 3,929,635
63 3,929,636
3,929,637
65 3,929,638
71 3,929,639
73 3,929,641
113 3,929,642
117 3,929,643
195 3,929,640
242 3,929,644
251 3,929,645
359 3,929,646
445 3,929,648

CLASS 211

102 3,929,228
134 3,929,229
177 3,929,230

CLASS 212

11 3,929,231

CLASS 213

43 3,929,232

CLASS 214

1BV 3,929,234
1R 3,929,233
2.5 3,929,235
86A 3,929,237
89 3,929,238
138R 3,929,239
152 3,929,240
390 3,929,241
3,929,242
518 3,929,243
674 3,929,244
764 3,929,245

CLASS 215

252 3,929,246

CLASS 219

99 3,930,136
125R 3,930,137
126 3,930,138
145 3,930,139
316 3,930,140

CLASS 220

9LG 3,929,247
19 3,929,248
71 3,929,249
237 3,929,250
268 3,929,251
269 3,929,252
320 3,929,253

CLASS 221

30 3,929,254
75 3,929,255
81 3,929,256
152 3,929,257

CLASS 222

1 3,929,258
61 3,929,259
88 3,929,260
195 3,929,261
210 3,929,262
373 3,929,263
525 3,929,264

CLASS 224

4D 3,929,265
26R 3,929,266

CLASS 226

74 3,929,267
176 3,929,268

CLASS 227

10 3,929,269

CLASS 228

50 3,929,270

CLASS 229

4.5 3,929,271
23C 3,929,272
34R 3,929,273
52B 3,929,274
55 3,929,275

CLASS 235

61PK 3,929,276
61.11E 3,930,141
61.6R 3,929,277
61.8R 3,929,278
88N 3,929,279
92EV 3,930,142
150.2 3,930,143
150.53 3,930,144
151.3 3,930,145
153AK 3,930,146
156 3,930,147

CLASS 236

1B 3,929,280
12R 3,929,281
3,929,282
3,929,283
13 3,929,285
46 3,929,284

CLASS 239

3 3,929,286
102 3,929,287
201 3,929,288
265.11 3,929,289
417.3 3,929,290
425 3,929,291
685 3,929,292

CLASS 240

1R 3,930,148
41.15 3,930,149

CLASS 241

42 3,929,293
55 3,929,236
101.7 3,929,294
190 3,929,295
197 3,929,296

CLASS 242

36 3,929,297
55.19R 3,929,298
65 3,929,299
107.4 3,929,300
118.11 3,929,301
155R 3,929,302
194 3,929,303
3,929,304

CLASS 244

117A 3,929,305
162 3,929,306

CLASS 246

130 3,929,307
169A 3,929,308

CLASS 248

118 3,929,309
217 3,929,311
226E 3,929,310
346.1 3,929,312

CLASS 250

203R 3,930,150
269 3,930,152
270 3,930,153
3,930,154
309 3,930,155
315A 3,930,156
330 3,930,157
3,930,158
338 3,930,159
361 3,930,160
370 3,930,161
385 3,930,162
398 3,930,163
468 3,930,164
480 3,930,165
506 3,930,166
572 3,930,167

CLASS 251

28 3,929,313
58 3,929,314
129 3,929,315
196 3,929,316
223 3,929,317

CLASS 252

3 3,929,649
33.4 3,929,650
41 3,929,651
46.7 3,929,652
3,929,653
48.2 3,929,654
51.5R 3,929,655
56R 3,929,656
62.1P 3,929,657
62.54 3,929,658
3,929,659
63.2 3,929,660
103 3,929,661
106 3,929,662
110 3,929,663
301.2P 3,929,664
301.4S 3,929,665
317 3,929,666
408 3,929,667
455R 3,929,670
3,929,671
455Z 3,929,668
3,929,669
3,929,672
463 3,929,673
465 3,929,681
466PT 3,929,682
3,929,683
514 3,929,674
522 3,929,675
3,929,676
3,929,677
526 3,929,678
527 3,929,679
542 3,929,680

CLASS 259

4 3,929,318
6 3,929,319
165 3,929,320
175 3,929,321
192 3,929,322
3,929,323

CLASS 260

2BP Re.28,670
2N Re.28,669
2R 3,929,684
2.5AJ 3,929,688
2.5EP 3,929,687
2.5HA 3,929,689
2.5HB 3,929,685
3,929,690
2.5B 3,929,686
7.5 3,929,692
17R 3,929,693
17.3 3,929,696
17.4ST 3,929,694
3,929,697
17.5 3,929,695
22CB 3,929,698
23ST 3,929,701
23XA 3,929,699
3,929,700
27BB 3,929,703
27R 3,929,702
29.1SB 3,929,704
3,929,708
29.6MN 3,929,705
29.6TA 3,929,706
29.7T 3,929,707
30.2 3,929,691
30.4N 3,929,709
30.8R 3,929,710
31.8B 3,929,711
3,929,712
32.6 3,929,713
33.4P 3,929,714
33.6AQ 3,929,715
37EP 3,929,716
3,929,717
37SB 3,929,718
40P 3,929,719
3,929,720
42.15 3,929,721
42.47 3,929,722
45.7S 3,929,723
45.75C 3,929,725
45.85B 3,929,726
45.9QB 3,929,855
45.9R 3,929,724
45.95F 3,929,727
75NH 3,929,729
75R 3,929,728
77.5AN 3,929,730
3,929,732
77.5B 3,929,731
77.5R 3,929,733
78R 3,929,734
78.3UA 3,929,735
78.4D 3,929,736
3,929,737
78.5B 3,929,739
78.5R 3,929,738
79.3MU 3,929,740
79.3M 3,929,741
79.3R 3,929,742
80.73 3,929,744
80.78 3,929,745
3,929,746
3,929,747
80.8 3,929,743
86.7 3,929,749
88.1P 3,929,748
89.7R 3,929,751
92.3 3,929,752
92.8W 3,929,753
94.9E 3,929,754
106 3,929,755
112.5LH 3,929,759
112.5R 3,929,756
3,929,757
3,929,758
197 3,929,760
210AB 3,929,762
210K 3,929,761
211.5R 3,929,763
3,929,764
239BC 3,929,766
239A 3,929,765
239.1 3,929,767
239.55D 3,929,768
239.55R 3,929,769
239.55 3,929,770
240R 3,929,771
240.4 3,929,772
242 3,929,773
243C 3,929,774
3,929,775
3,929,776
3,929,777
3,929,778
3,929,779
3,929,780
3,929,781
3,929,782
243R 3,929,783
247.5GP 3,929,784
248AS 3,929,785
251A 3,929,786
3,929,787
256.4C 3,929,788
3,929,789
267 3,929,790
268BC 3,929,793
268PH 3,929,792
3,930,008
268TR 3,929,791
270 3,929,794
284 3,929,795
285.5 3,929,796
287CE 3,929,797
287K 3,929,798
290R 3,929,800
290V 3,929,799
293.58 3,929,802
293.6 3,929,801
293.62 3,929,803
293.63 3,929,804
294.8C 3,929,805
3,929,809
294.8E 3,929,806
294.8G 3,929,808
294.8R 3,929,807
294.9 3,929,810
295.5B 3,929,812
295.5R 3,929,811
296M 3,929,813
302H 3,929,814
304A 3,929,815
306.8D 3,929,816
307C 3,929,817
308D 3,929,818
309 3,929,819
3,929,820
309.2 3,929,821
3,929,822
3,929,823
3,929,824
310A 3,929,827
310C 3,929,825
310D 3,929,826
310R 3,929,828
326.1 3,929,830
326.15 3,929,829
326.34 3,929,831
329.3 3,929,832
332.2C 3,929,833
343.2R 3,929,834
345.3 3,929,835
346.2R 3,929,836
3,929,837
3,929,838
347.8 3,929,839
348A 3,929,840
369 3,929,841
376 3,929,842
383 3,929,843
397.4 3,929,844
404 3,929,845
410.6 3,929,846
3,929,847
438.5R 3,929,848
448C 3,929,849
448.2E 3,929,850
3,929,851
455R 3,929,852
456R 3,929,853
458 3,929,854
465E 3,929,856
465.5R 3,929,857
465.7 3,929,858
465.8R 3,929,859
465.9 3,929,860
468D 3,929,861
3,929,862
471C 3,929,865

471R 2,929,863
3,929,864
475P 3,929,866
3,929,867
3,929,868
482C 3,929,869
484A 3,929,870
501.17 3,929,871
515R 3,929,872
531R 3,929,873
534M 3,929,874
537R 3,929,875
544L 3,929,876
552SC 3,929,877
555A 3,929,878
559A 3,929,880
559S 3,929,879
561N 3,929,881
564RF 3,929,883
564R 3,929,882
3,929,884
566A 3,929,885
567.6P 3,929,886
570.5CA 3,929,888
570.5P 3,929,887
571 3,929,889
580 3,929,891
586P 3,929,894
586R 3,929,893
3,929,895
593R 3,929,896
602 3,929,897
604HF 3,929,898
3,929,900
604R 3,929,899
607A 3,929,901
612R 3,929,902
613D 3,929,904
613R 3,929,903
614R 3,929,905
618D 3,929,906
619R 3,929,907
620 3,929,908
621B 3,929,910
621G 3,929,913
621R 3,929,909
3,929,911
624C 3,929,912
635E 3,929,914
3,929,915
645 3,929,916
3,929,917
653.9 3,929,918
3,929,920
654R 3,929,919
666PY 3,929,922
666A 3,929,921
667 3,929,923
683.42 3,929,924
683.48 3,929,925
3,929,926
837R 3,929,927
859R 3,929,928
3,929,929
874 3,929,750
3,929,930
3,929,931
876B 3,929,932
876R 3,929,933
884 3,929,934
885 3,929,935
892 3,929,936
896 3,929,937
897A 3,929,939
897B 3,929,938
930 3,929,940

CLASS 261

35 3,929,941
39B 3,929,942

CLASS 264

25 3,929,943
34 3,929,944
41 3,929,945
3,929,946
42 3,929,947
45.5 3,929,948
46.4 3,929,949
49 3,929,950
89 3,929,951
94 3,929,952
3,929,953
97 3,929,954
117 3,929,955
137 3,929,956
150 3,929,957
249 3,929,958
292 3,929,959
3,929,960

CLASS 266

23K 3,929,324

CLASS 269

218 3,929,325

CLASS 271

3.1 3,929,326
250 3,929,327
267 3,929,328

CLASS 272

57D 3,929,329
57R 3,929,335
63 3,929,330
79D 3,929,331

CLASS 273

1M 3,929,332
22 3,929,333
26A 3,929,334
108 3,929,336
134C 3,929,337
138 3,929,338
148A 3,929,339

CLASS 277

134 3,929,340
3,929,341
141 3,929,342

CLASS 279

1B 3,929,343

CLASS 280

11.35C 3,929,344
11.37E 3,929,345
87R 3,929,346
104.5R 3,929,347
150AB 3,929,348
3,929,350
150SB 3,929,351
150B 3,929,349
154.5R 3,929,352
423R 3,929,353
490R 3,929,354

CLASS 285

39 3,929,355
305 3,929,356
319 3,929,357
353 3,929,358
401 3,929,359

CLASS 290

53 3,930,168

CLASS 292

67 3,929,360
216 3,929,361
291 3,929,362

CLASS 294

19R 3,929,363
3,929,364
21 3,929,365
88 3,929,366
99R 3,929,367
103 3,929,368

CLASS 296

1S 3,929,369
23MC 3,929,370
24R 3,929,371
28B 3,929,372

CLASS 297

19 3,929,373
61 3,929,374
440 3,929,375
445 3,929,376

CLASS 299

39 3,929,377
64 3,929,378

CLASS 302

24 3,929,379

CLASS 303

21BE 3,929,382
21F 3,929,380
3,929,381
3,929,383
22R 3,929,384

CLASS 305

56 3,929,385

CLASS 307

225C 3,930,169
254 3,930,170
270 3,930,171
297 3,930,172

CLASS 308

3.6 3,929,386
3.8 3,929,387
4A 3,929,388
6R 3,929,389
10 3,929,390
20 3,929,391
26 3,929,392
76 3,929,393
121 3,929,394
167 3,929,395
241 3,929,396

CLASS 310

26 3,930,173
29 3,930,174
160 3,930,175

CLASS 313

220 3,930,176
271 3,930,177
275 3,930,178
296 3,930,179
417 3,930,180
421 3,930,181

CLASS 315

3.5 3,930,182
71 3,930,183
241P 3,930,184
370 3,930,185

CLASS 317

13B 3,930,186
18D 3,930,187
103 3,930,188

CLASS 318

52 3,930,189
254 3,930,190
376 3,930,191

CLASS 320

15 3,930,192

CLASS 321

2 3,930,193
11 3,930,194
45C 3,930,195
47 3,930,196

CLASS 322

28 3,930,197

CLASS 324

29.5 3,930,198
78D 3,930,199

CLASS 325

134 3,930,200

CLASS 328

1 3,930,201
142 3,930,202
155 3,930,203
229 3,930,204

CLASS 330

2 3,930,205
53 3,930,206
207P 3,930,207

CLASS 333

14 3,930,208
23 3,930,209
79 3,930,210

CLASS 335

6 3,930,211
284 3,930,212

CLASS 337

70 3,930,213
72 3,930,214
407 3,930,215

CLASS 340

5C 3,930,216
7R 3,930,254
15.5TN 3,930,217
17 3,930,218
3,930,219
18FM 3,930,220
52C 3,930,222
52R 3,930,221
58 3,930,223
3,930,224
62 3,930,225
64 3,930,226
81R 3,930,227
146.3AG 3,930,230
146.3MA 3,930,231
146.3SG 3,930,228
146.3SY 3,930,229
172.5 3,930,232
3,930,233
3,930,234
3,930,235
3,930,236
3,930,237
173R 3,930,238
3,930,239
173.2 3,930,240
174TF 3,930,241
3,930,242
3,930,243
3,930,244
188R 3,930,245
214 3,930,246
237S 3,930,247
267R 3,930,248
280 3,930,249
324AD 3,930,251
324A 3,930,250
347AD 3,930,253
3,930,255
347NT 3,930,252
347R 3,930,256

CLASS 346

74ES 3,930,257
75 3,930,258
139R 3,930,259
140 3,930,260

CLASS 350

216 3,929,397

CLASS 354

25 3,930,261
174 3,930,264
267 3,930,262
268 3,930,263

CLASS 356

186 3,929,398

CLASS 360

45 3,930,265
62 3,930,266
69 3,930,267
96 3,930,268
3,930,269
130 3,930,270

CLASS 417

54 3,929,399
516 3,929,400

CLASS 423

4 3,929,961
82 3,929,962
86 3,929,963
183 3,929,964
213.5 3,929,965
239 3,929,966
242 3,929,967
3,929,968
263 3,929,969
299 3,929,970
308 3,929,971
325 3,929,972
417 3,929,973
478 3,929,974
496 3,929,975
511 3,929,976
520 3,929,977
607 3,929,978
648 3,929,979
3,929,980

CLASS 424

1 3,929,981
12 3,929,982
17 3,929,983
22 3,929,984
45 3,929,985
46 3,929,986
52 3,929,987
54 3,929,988
78 3,929,990
3,929,991
122 3,929,992
177 3,929,993
3,929,994
178 3,929,995
182 3,929,996
195 3,929,997
200 3,929,998
227 3,929,989
228 3,929,999
245 3,930,000
246 3,930,001
3,930,002
248 3,930,003
250 3,930,004
253 3,930,005
254 3,930,006
263 3,930,007
273 3,930,009
3,930,010
3,930,011
278 3,930,012
3,930,013
285 3,930,014
298 3,930,015
300 3,930,016
309 3,930,017
322 3,930,018
326 3,930,019
327 3,930,020
3,930,021
330 3,930,022
341 3,930,023
343 3,930,024
346 3,930,025

CLASS 426

3 3,930,026
28 3,930,027
41 3,930,028
44 3,930,029
63 3,930,030
89 3,930,031
97 3,930,032
103 3,930,033
104 3,930,034
140 3,930,035
3,930,036
268 3,930,037
269 3,930,038
271 3,930,039
312 3,930,040
396 3,930,041
475 3,930,042
515 3,930,043
533 3,930,044
3,930,045
3,930,046
546 3,930,047
5'8 3,930,048
549 3,930,049
564 3,930,050
573 3,930,051
576 3,930,052
577 3,930,057
580 3,929,890
582 3,929,892
590 3,930,053
614 3,930,054
644 3,930,055
646 3,930,056
656 3,930,058

CLASS 427

2 3,930,059
12 3,930,060
27 3,930,061
3,930,062
54 3,930,063
3,930,064
79 3,930,066
86 3,930,067
89 3,930,065
140 3,930,068
142 3,930,069
185 3,930,070
203 3,930,071
306 3,930,072
341 3,930,073
3,930,074
349 3,930,075
353 3,930,076
384 3,930,077
388 3,930,078
396 3,930,079
411 3,930,080
421 3,930,081

CLASS 428

67 3,930,083
3,930,084
116 3,930,085
131 3,930,086
143 3,930,088
196 3,930,090
198 3,930,091
204 3,930,092
208 3,930,093
212 3,930,089
240 3,930,094
251 3,930,095
255 3,930,082
3,930,096
260 3,930,097
278 3,930,087
280 3,930,098
315 3,930,099
323 3,930,100
326 3,930,101
354 3,930,102
361 3,930,103
379 3,930,104
398 3,930,105
399 3,930,106
407 3,930,107
411 3,930,108
422 3,930,109
424 3,930,110

CLASSIFICATION OF DESIGNS

D 2— 310 238,216
319 238,217
238,218
238,219
D 6— 48.1 238,220
238,221
59 238,222
63 238,223
73 238,224
85 238,225
91 238,226
238,227
114 238,228
136 238,229
158 238,230
195 238,231
238,232
197 238,233
198 238,234
201 238,235
D 7— 17 238,236
238,237
39 238,238
42 238,239
129 238,240
132 238,241
178 238,242
D 8— 14.1 238,243
18 238,244
57 238,245
71 238,246
99 238,247
D 9— 63 238,248
178 238,249
187 238,250
191 238,251
193 238,252
D10— 15 238,253
38 238,254
44 238,255
46 238,256
111 238,257
116 238,258
D12— 15 238,259
60 238,261
61 238,260
136 238,262
143 238,263
145 238,264
156 238,265
158 238,266
194 238,267
238,268
D13— 1B 238,270
238,271
M 238,269
6 238,272
D23— 19 238,273
238,274
49 238,275
238,276
94 238,277
144 238,278
D24— 1D 238,279
238,280
238,281
D26— 5C 238,282
238,283
D34— 12 238,314
5GH 238,285
QQ 238,287
SS 238,288
238,289
238,290
VV 238,284
14C 238,286
15CC 238,291
D45— 4C 238,293
238,294
16R 238,292
D48— D 238,295
20E 238,296
D49— 11 238,297
D54— 1A 238,298
D55— 238,302
B 238,301
E 238,299
238,300
D57— 238,304
F 238,303
Q 238,305
D64— 11B 238,306
D83— 1H 238,307
V 238,308
12R 238,309
D86— 10G 238,311
N 238,310
D87— 1B 238,312
D88— 3 238,313

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama 1
Alaska 2
American Samoa 3
Arizona 4
Arkansas 5
California 6
Canal Zone 7
Colorado 8
Connecticut 9
Delaware 10
District of Columbia 11
Florida 12
Georgia 13
Guam 14
Hawaii 15
Idaho 16
Illinois 17
Indiana 18
Iowa 19
Kansas 20
Kentucky 21
Louisiana 22
Maine 23
Maryland 24
Massachusetts 25
Michigan 26
Minnesota 27
Mississippi 28
Missouri 29
Montana 30
Nebraska 31
Nevada 32
New Hampshire 33
New Jersey 34
New Mexico 35
New York 36
North Carolina 37
North Dakota 38
Ohio 39
Oklahoma 40
Oregon 41
Pennsylvania 42
Puerto Rico 43
Rhode Island 44
South Carolina 45
South Dakota 46
Tennessee 47
Texas 48
Utah 49
Vermont 50
Virginia 51
Virgin Islands 52
Washington 53
West Virginia 54
Wisconsin 55
Wyoming 56
U.S. Air Force 57
U.S. Army 58
U.S. Navy 59

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

3,929,311
3,930,254
1 : 3,929,119
3,929,456
3,929,947
3,930,247
3,930,257
2 : 3,928,872
3,928,903
4 : 3,928,926
3,928,947
3,929,365
3,929,425
3,929,528
3,929,598
3,930,059
3,930,100
3,930,169
3,930,245
5 : 3,929,019
6 : 3,928,871
3,928,874
3,928,876
3,928,888
3,928,904
3,928,928
3,928,931
3,928,932
3,928,934
3,928,936
3,928,942
3,928,946
3,928,974
3,928,991
3,929,001
3,929,003
3,929,020
3,929,025
3,929,035
3,929,048
3,929,053
3,929,072
3,929,074
3,929,076
3,929,080
3,929,084
3,929,086
3,929,125
3,929,126
3,929,140
3,929,143
3,929,145
3,929,149
3,929,174
3,929,208
3,929,209
3,929,214
3,929,222
3,929,247
3,929,258
3,929,266
3,929,273
3,929,312
3,929,313
3,929,327
3,929,332
3,929,344
3,929,349
3,929,354
3,929,358
3,929,360
3,929,362
3,929,366
3,929,370
3,929,373
3,929,386
3,929,393
3,929,402
3,929,413
3,929,429
3,929,433
3,929,493
3,929,505
3,929,511
3,929,533
3,929,548
3,929,549
3,929,603
3,929,628
3,929,644
3,929,650
3,929,664
3,929,672
3,929,723
3,929,821
3,929,822
3,929,823
3,929,824
3,929,894
3,929,896
3,929,972
3,929,984
3,930,037
3,930,038
3,930,040
3,930,047
3,930,049
3,930,050
3,930,083
3,930,084
3,930,091
3,930,111
3,930,114
3,930,116
3,930,120
3,930,123
3,930,127
3,930,145
3,930,148
3,930,150
3,930,156
3,930,163
3,930,170
3,930,171
3,930,172
3,930,175
3,930,221
3,930,229
3,930,241
3,930,243
3,930,244
3,930,255
3,930,265
8 : 3,928,973
3,929,011
3,929,164
3,929,193
3,929,329
3,929,461
3,929,788
3,929,929
3,930,261
9 : Re.28,670
3,928,887
3,928,913
3,928,924
3,929,250
3,929,269
3,929,330
3,929,374
3,929,396
3,929,516
3,929,564
3,929,566
3,929,570
3,929,580
3,929,594
3,929,642
3,929,732
3,929,733
3,929,751
3,929,803
3,929,818
3,929,928
3,929,956
3,930,001
3,930,097
3,930,104
3,930,181
3,930,187
10 : 3,928,917
3,929,447
3,929,448
3,929,473
3,929,659
3,929,674
3,929,749
3,929,752
3,929,882
3,929,915
3,929,934
3,929,943
3,929,968
3,930,010
11 : 3,930,068
12 : 3,928,907
3,929,023
3,929,060
3,929,173
3,929,398
3,929,487
3,929,491
3,929,606
3,929,755
3,929,938
3,930,132
3,930,192
3,930,240
3,930,246
13 : Re.28,666
3,929,006
3,929,062
3,929,264
3,929,275
3,929,285
3,929,555
3,929,557
3,929,701
16 : 3,929,199
3,929,554
3,929,585
3,929,597
17 : 3,928,883
3,928,890
3,928,891
3,928,894
3,928,952
3,928,997
3,929,017
3,929,022
3,929,033
3,929,051
3,929,054
3,929,078
3,929,088
3,929,089
3,929,099
3,929,111
3,929,122
3,929,128
3,929,134
3,929,144
3,929,150
3,929,176
3,929,207
3,929,237
3,929,260
3,929,314
3,929,315
3,929,331
3,929,336
3,929,340
3,929,394
3,929,412
3,929,414
3,929,421
3,929,423
3,929,478
3,929,615
3,929,655
3,929,669
3,929,673
3,929,683
3,929,711
3,929,748
3,929,758
3,929,830
3,929,835
3,929,892
3,929,912
3,929,926
3,929,944
3,929,952
3,929,980
3,930,031
3,930,033
3,930,035
3,930,036
3,930,043
3,930,057
3,930,058
3,930,062
3,930,063
3,930,072
3,930,082
3,930,101
3,930,118
3,930,146
3,930,249
3,930,258
18 : 3,928,995
3,929,029
3,929,042
3,929,158
3,929,165
3,929,251
3,929,426
3,929,575
3,929,645
3,929,688
3,929,697
3,929,713
3,929,796
3,929,991
3,930,023
3,930,046
3,930,061
19 : 3,928,885
3,929,131
3,929,239
3,929,255
3,929,292
3,929,660
3,930,142
20 : 3,928,955
3,928,971

3,929,132
3,929,369
3,929,449
3,929,813
3,929,815
3,929,996
3,930,226
21 : 3,929,071
3,929,231
3,929,284
22 : 3,928,935
3,929,535
3,929,703
23 : 3,929,090
24 : 3,928,877
3,928,911
3,929,015
3,929,055
3,929,217
3,929,308
3,929,384
3,929,435
3,929,574
3,929,620
3,929,621
3,929,634
3,929,717
3,929,927
3,929,949
3,929,965
3,930,197
25 : 3,929,018
3,929,157
3,929,171
3,929,390
3,929,422
3,929,424
3,929,480
3,929,507
3,929,514
3,929,587
3,929,610
3,929,722
3,929,756
3,929,786
3,929,797
3,929,829
3,929,848
3,930,032
3,930,176
3,930,184
3,930,198
3,930,215
3,930,231
3,930,232
3,930,237
3,930,238
3,930,251
26 : Re.28,669
3,928,889
3,928,930
3,928,963
3,928,964
3,928,968
3,928,984
3,929,031
3,929,036
3,929,038
3,929,064
3,929,070
3,929,117
3,929,129
3,929,159
3,929,161
3,929,200
3,929,211
3,929,223
3,929,232
3,929,242
3,929,243
3,929,249
3,929,317
3,929,333
3,929,341
3,929,347
3,929,348
3,929,351
3,929,381
3,929,382
3,929,383
3,929,385
3,929,506
3,929,530
3,929,534
3,929,586
3,929,592

3,929,647
3,929,745
3,929,856
3,929,861
3,929,862
3,929,897
3,929,942
3,930,012
3,930,019
3,930,020
3,930,021
3,930,024
3,930,027
3,930,069
3,930,071
27 : 3,928,882
3,929,123
3,929,124
3,929,187
3,929,204
3,929,225
3,929,261
3,929,270
3,929,310
3,929,328
3,929,418
3,929,419
3,929,420
3,929,476
3,929,513
3,929,551
3,929,552
3,929,989
3,930,056
3,930,167
3,930,225
28 : 3,928,880
3,929,865
29 : 3,928,923
3,928,956
3,929,012
3,929,101
3,929,212
3,929,450
3,929,632
3,929,635
3,929,744
3,929,875
3,930,000
30 : 3,929,120
3,929,154
3,929,294
31 : 3,929,104
3,929,234
32 : 3,929,233
33 : 3,929,318
3,929,941
3,930,158
3,930,233
34 : 3,928,906
3,928,921
3,928,961
3,928,975
3,928,976
3,928,977
3,928,996
3,929,081
3,929,102
3,929,138
3,929,142
3,929,252
3,929,262
3,929,323
3,929,334
3,929,399
3,929,434
3,929,451
3,929,455
3,929,490
3,929,500
3,929,509
3,929,510
3,929,525
3,929,536
3,929,550
3,929,553
3,929,576
3,929,589
3,929,619
3,929,640
3,929,641
3,929,658
3,929,667
3,929,675
3,929,676
3,929,677

3,929,679
3,929,699
3,929,705
3,929,727
3,929,730
3,929,735
3,929,738
3,929,739
3,929,741
3,929,766
3,929,777
3,929,783
3,929,787
3,929,790
3,929,811
3,929,814
3,929,840
3,929,849
3,929,858
3,929,866
3,929,876
3,929,884
3,929,885
3,929,895
3,929,904
3,929,905
3,929,906
3,929,916
3,929,919
3,929,932
3,929,937
3,929,981
3,929,987
3,929,988
3,929,998
3,930,005
3,930,009
3,930,011
3,930,013
3,930,022
3,930,055
3,930,066
3,930,073
3,930,074
3,930,076
3,930,117
3,930,177
3,930,185
3,930,204
3,930,206
3,930,227
35 : 3,929,155
3,929,345
3,929,601
3,929,999
36 : Re.28,668
3,928,886
3,928,898
3,928,901
3,928,902
3,928,914
3,928,915
3,928,922
3,928,948
3,928,951
3,928,993
3,929,002
3,929,021
3,929,069
3,929,094
3,929,095
3,929,096
3,929,098
3,929,139
3,929,156
3,929,185
3,929,216
3,929,221
3,929,224
3,929,228
3,929,254
3,929,295
3,929,303
3,929,304
3,929,363
3,929,375
3,929,376
3,929,410
3,929,427
3,929,462
3,929,464
3,929,466
3,929,474
3,929,475
3,929,477

3,929,482
3,929,484
3,929,489
3,929,519
3,929,527
3,929,529
3,929,591
3,929,646
3,929,657
3,929,662
3,929,692
3,929,694
3,929,700
3,929,704
3,929,760
3,929,772
3,929,800
3,929,828
3,929,845
3,929,878
3,929,887
3,929,908
3,929,933
3,929,954
3,929,962
3,929,982
3,930,026
3,930,034
3,930,051
3,930,108
3,930,136
3,930,165
3,930,168
3,930,173
3,930,183
3,930,193
3,930,194
3,930,196
3,930,200
3,930,207
3,930,209
3,930,230
37 : 3,928,939
3,928,986
3,929,289
3,929,639
3,929,957
3,930,077
39 : 3,928,905
3,928,910
3,929,121
3,929,135
3,929,137
3,929,167
3,929,189
3,929,229
3,929,257
3,929,286
3,929,287
3,929,290
3,929,307
3,929,356
3,929,357
3,929,359
3,929,483
3,929,494
3,929,538
3,929,556
3,929,609
3,929,678
3,929,702
3,929,726
3,929,729
3,929,737
3,929,746
3,929,802
3,929,825
3,929,832
3,929,855
3,929,857
3,929,859
3,929,879
3,929,899
3,929,939
3,929,948
3,929,985
3,930,045
3,930,053
3,930,095
3,930,129
3,930,130
3,930,140
3,930,149
3,930,160
3,930,174
3,930,252

40 : 3,929,248
3,929,388
3,929,430
3,929,438
3,929,599
3,929,623
3,929,689
3,929,708
3,929,860
3,929,918
3,929,924
3,929,925
3,930,078
3,930,085
3,930,217
41 : 3,929,049
3,929,146
3,929,202
3,929,309
3,929,446
3,929,459
3,929,468
3,930,110
3,930,259
42 : 3,928,937
3,928,953
3,928,960
3,928,972
3,928,999
3,929,032
3,929,046
3,929,075
3,929,151
3,929,179
3,929,194
3,929,210
3,929,219
3,929,244
3,929,259
3,929,268
3,929,293
3,929,335
3,929,346
3,929,371
3,929,407
3,929,439
3,929,441
3,929,442
3,929,444
3,929,470
3,929,479
3,929,504
3,929,508
3,929,521
3,929,522
3,929,532
3,929,541
3,929,561
3,929,562
3,929,563
3,929,584
3,929,588
3,929,611
3,929,626
3,929,631
3,929,684
3,929,690
3,929,693
3,929,742
3,929,759
3,929,781
3,929,808
3,929,810
3,929,843
3,929,852
3,929,872
3,929,889
3,929,917
3,929,923
3,929,970
3,929,971
3,929,975
3,929,976
3,929,977
3,929,990
3,930,015
3,929,652
3,929,668
3,929,686
3,929,709
3,929,846
3,929,847
3,929,867
3,929,873
3,930,152
3,930,153

3,930,154
3,930,216
3,930,218
3,930,219
49 : 3,928,925
3,928,965
3,929,321
3,930,086
51 : 3,929,305
3,929,364
3,929,544
3,930,164
3,930,248
53 : Re.28,667
3,929,197
3,929,325
3,930,143
54 : 3,929,721
3,929,969
3,930,002
55 : 3,928,893
3,928,929
3,929,037
3,929,041
3,929,050
3,929,103
3,929,116
3,929,177
3,929,218
3,929,236
3,929,271
3,929,272
3,929,492
3,929,499
3,929,743
3,929,967
3,930,025
3,930,030
3,930,075
3,930,094
3,930,133
3,930,134
3,930,189
3,930,210
3,930,213
3,930,214
3,930,220
43 : 3,930,211
44 : 3,929,085
3,930,090
45 : 3,928,938
3,929,013
3,929,130
3,929,301
3,929,406
3,929,453
3,929,543
3,929,637
3,930,096
47 : 3,928,969
3,929,160
3,929,198
3,929,277
3,929,725
3,929,868
3,929,935
3,929,979
3,930,126
48 : 3,928,896
3,928,919
3,928,927
3,929,014
3,929,024
3,929,058
3,929,083
3,929,152
3,929,153
3,929,166
3,929,175
3,929,190
3,929,191
3,929,192
3,929,206
3,929,235
3,929,241
3,929,306
3,929,316
3,929,353
3,929,391
3,929,431
3,929,465
3,929,537
3,929,545
3,929,616
3,929,622
3,929,630

6	:	238,223	9	:	238,220			238,279	34	:	238,247
		238,243			238,221			238,280			238,252
		238,246			238,244			238,288	36	:	238,242
		238,255			238,258			238,299			238,251
		238,257	12	:	238,249			238,300			238,289
		238,259			238,265			238,302			238,292
		238,266			238,274	18	:	238,290			238,293
		238,270	17	:	238,229	21	:	238,278			238,294
		238,271			238,233	25	:	238,216			238,296
		238,281			238,267			238,287			238,298
		238,283			238,268			238,303			238,301
		238,305			238,272	27	:	238,314			238,312
		238,306			238,275	28	:	238,217	39	:	238,218
		238,313									

		238,219	44	:	238,236			
		238,226	47	:	238,310			
		238,227			238,311			
		238,231	48	:	238,222			
		238,232			238,228			
		238,234			238,254			
		238,238			238,309			
		238,241	55	:	238,239			
		238,263			238,248			
		238,284			238,250			
41	:	238,225			238,260			
42	:	238,230			238,261			
		238,276			238,308			

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*

C 32
0585
1 32E
2 5E3
3 32E
4 283
5 582
6 E38